

FOILING FRAUD

Online, no one knows you're a fraud.
Or do they? Page 40



NO MORE PRIVACY

Technology is changing us so completely,
personal privacy may be dying. Page 58

SILICON WHAT?

Silicon Mesa, Silicon Schmesa. Don't buy every
hokey high-tech nickname you hear. Page 44

COMPUTERWORLD

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SUSPICIOUS SERVER PROBES MULTIPLY

*Experts warn that more sophisticated
hacks of vulnerable networks are coming*

BY DAN VERTON

The number of suspicious probes and scans designed to find vulnerable domain name servers on corporate networks shot up 280% last month and continues to climb, according to IT managers and a new survey conducted by a network security monitoring firm.

A survey released last week by Alameda, Calif.-based Pilot Network Services Inc. found that suspected hackers made as many as 6,000 attempts last month — compared to approximately 2,200 in December — to

CYBER THREAT

locate vulnerable domain name servers across corporate networks. Pilot collected the information for the survey from its regional network operations centers, which monitor 70,000 corporate networks belonging to Pilot clients worldwide.

The spike in the number of scans came as no surprise to many users and security experts, who said hackers are stepping up their efforts to uncover corporate systems that haven't been fixed for vulnerabilities discovered last month
Server Probes, page 73

AIRPORTS GROUND USE OF WIRELESS

*Safety, loss of income
from pay phones cited*

BY BOB BREWIN

Airport operators already control the airspace in their regions. Now they want the airwaves, too.

Baltimore/Washington International Airport last week became the latest airport to clamp

down on the public wireless LAN industry as well as on cellular carriers that operate on airport turf. Their concern: wireless interference with other systems, but also a decline in pay-phone revenue that has prompted some airports to look for ways to seek income from wireless technology.

Seattle-Tacoma International Airport earlier this year declared a 90-day moratorium on wireless installations, until it can develop a regulatory and business strategy. BWI hasn't
Wireless, page 14

SCOTT NEWTON, IT director at baked-goods company Otis Spunkmeyer, saw a dramatic drop in laptop support problems after Windows 2000 was installed.



JENNY THOMAS

WINDOWS 2000 USERS RAMP UP

Could it be the end of the "blue screen of death"? Early users of Microsoft's Windows 2000 Professional and Server editions say both are stable and reliable — a major accomplishment. But a year after the operating system's release, Robert L. Mitchell reports that implementing Active Directory is still a daunting task.
Story begins on page 18.

BIG PUSH TO WIN 2K EXPECTED IN '01

*Firms dragged feet on
OS during its first year*

BY CAROL SLIWA

Microsoft Corp. last week officially unveiled a new Windows operating system, but the majority of corporate users won't finish or even start the lengthy and complex adoption of the last one, Windows 2000, until later this year.

A year after its release, Windows 2000 is scoring high marks among early

adopters for stability, reliability and performance. But a Computerworld poll of more than a dozen user groups and a review of various analyst studies show that most companies, both large and small, haven't been rushing to change due to cost considerations, complexity, lack of trained staff and reliability concerns they hope will be alleviated as the product matures.

"We still speak with a lot of enterprises [that] are just starting testing phases and are
Windows 2000, page 16

Why the Wait

Reasons for delaying installations of Active Directory:

- Complexity
- Lack of trained IT staff
- Problems during pilot testing
- Advanced management and design limitations of the 1.0 release of Windows 2000

SOURCE: GIGA INFORMATION GROUP INC., SUNBELT SOFTWARE SURVEY OF MORE THAN 1,200 IT PROFESSIONALS

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NETWORK



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I PREFER
BANDWIDTH CHALLENGED

ACTUALLY,
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BANDWIDTH
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James Scott

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MAKING MAGIC ON THE WEB

As a child, David Holland was fascinated with magic. That passion serves him well as Web application developer at Dark Horse Comics, whose six Web sites feature animated serial movies, online comic books, downloadable games and a host of merchandise related to fantasy entertainment, from *The Ring of the Nibelung* to *Buffy the Vampire Slayer*. Page 64

MEASURING SUCCESS ON THE NET

The all-too-visible fizzle of dozens of Internet companies has led many executives to demand detailed status reports on how their own e-commerce sites compare. But there's not a lot of deep historical benchmarking data to measure against. Page 42



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- 7 NAPSTER LOSES** on appeal, but observers doubt the U.S. government can really regulate peer-to-peer services.
- 8 EYT LAUNCHES** an ASP system for hospitals and emergency medical personnel, who can use it to see which emergency rooms are available.
- 8 PROCTER & GAMBLE** and Cinergy are building a fiber-optic network in Cincinnati and donating some of the bandwidth to nonprofit groups.
- 10 LOVE-STRUCK ROMEOS** have to wait on Valentine's Day, as heavy traffic slows online florists' Web sites.
- 12 THE PUSH TO EXTEND** the Internet tax moratorium begins in Congress, as companies question how they might be affected if the effort fails.
- 73 THE KOURNIKOVA WORM** spread quickly throughout the U.S. but did little harm, especially to the users who learned their lessons from previous viruses.

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ONLINE

For news, opinions, analysis and interactive discussion forums focused on Windows 2000, head to our **Windows 2000 Community**. www.computerworld.com/win2k



Security reporter **Deborah Radcliff** introduces us to the people who are tracking down spammers and Internet fraudsters,

in the **E-Commerce Community**. www.computerworld.com/ecommerce

Meanwhile, reporter **Jennifer DiSabatino** contemplates what happens when warnings about a virus that clogs your e-mail system actually clog your e-mail system. Read the tongue-in-cheek account of her week covering the Anna Kournikova virus, on the **Security Watch** page. www.computerworld.com/security

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- merce at your company.
- 39 ED YOURDON** reveals the two important questions managers must ask at the start of IT projects regarding their success or failure.
- 74 FRANK HAYES** warns that if you install off-the-shelf enterprise software, you may have to ask: "Do we want to surrender control of the way we do business?"

AT DEADLINE

Dell Announces First Layoffs in Its History

Despite issuing a profit warning last month, Dell Computer Corp. on Feb. 15 announced what it called "strong" results for its fourth quarter ended Feb. 2, due in part to a 63% increase in demand for its servers. Even so, the Round Rock, Texas-based company said it will lay off 4%, or 1,700, of its full-time staff as a cost-cutting measure. Dell doesn't expect to announce any more across-the-board layoffs this fiscal year, said Kevin Rollins, one of Dell's two vice chairmen. The job cuts — the company's first — were made as soon as Dell felt the impact of "a global recession," Rollins said.

Verizon Faces Lawsuit

NorthPoint Communications Group Inc. has been given the go-ahead to take a \$1 billion compensation claim against Verizon Communications to court. San Francisco-based Digital Subscriber Line (DSL) service provider NorthPoint filed suit against New York-based Verizon last December in response to Verizon's attempt to terminate an agreement to merge the two companies' DSL businesses.

Shuttle Astronaut Phones Home

Marsha Ivins last week became the first astronaut to make a telephone call to Earth. She made the call to NASA flight director Bob Castle at Houston Mission Control from the space shuttle *Atlantis*. Ivins used a notebook PC loaded with software called IP SoftPhone from San Jose-based Cisco Systems Inc.

Short Takes

Hong Kong investment companies **HUTCHISON WHAMPOA LTD.** and **CHEUNG KONG HOLDINGS LTD.** said they have together acquired **PRICELINE.COM INC.** stock worth \$24 million from the Norwalk, Conn.-based company's founder, Jay Walker. . . . IBM said it will spend as much as \$200 million in the next four years to pay for Linux development in the Asia/Pacific region.

CRM Helps Ward Off Trouble Before It Starts

When the Firestone tire scare hit, a CRM system helped avert disaster at Michelin

BY MARC L. SONGINI

THE TIRE BLOWOUT disaster that overwhelmed Firestone last summer had an unexpected positive effect on one of its top competitors.

After a spate of news stories last August about defective Firestone tires causing fatal accidents, concerned customers inundated the call center at Greenville, S.C.-based Michelin North America Inc. to make sure that their tires didn't have the same problems. But despite the 100% spike in call center activity, Michelin was able to meet the challenge, thanks to a customer relationship management (CRM) package it had put in place just nine months before the crisis hit, said Michelin officials.

"There was a halo effect from that particular situation," said Larry Mims, centralized services team manager at Michelin. "If we had not had the [CRM system in place], we would have had additional costs in extra manpower."

Michelin's situation illustrates the need to have a solid CRM system in place — not just to better serve customers but also to cope with the unexpected, observers said.

"The last thing you want to do is hang up on the customer complaint," said Mike Schiff, director of data warehousing strategies at research firm Current Analysis in Sterling, Va.

Unfortunately, at Nashville-based Bridgestone/Firestone Inc., things didn't run so smoothly.

After the tire recall was announced, the number of hits on the company's Web site more than doubled, crashing the site for 12 hours. The firm had to turn to an external Internet service provider to assist with the Web site hosting.

"We have learned that you can never be too prepared for a crisis," said a Bridgestone spokeswoman, who explained

that the company is now evaluating its customer relations systems and expanding its Web-based services.

Dearborn, Mich.-based Ford Motor Co., whose Explorer sport utility vehicles were most affected by the faulty tires, also had to establish a high-tech, quick-response "war room" to cope with managing the tire recall and replacement efforts [News, Sept. 25].

Fortuitous Preparation

Luckily for Michelin, it had installed a CRM system from Astute Inc. in Columbus, Ohio, in November 1999 for less than \$500,000. Without it, "we might not have been able to capture as much of the infor-

mation from the consumers as we otherwise would have," said Chad Hake, Michelin's director of consumer relationships.

Using a customer's phone number, Michelin was able to aggregate information about individual tire owners and get an idea of the concerns they had with a given tire on a particular type of car, said Hake.

Michelin was not only able to handle the huge influx of calls, faxes and Web inquiries, but it was also able to collect valuable data from customers that could later be used for marketing and to improve CRM processes, Hake added.

But installing a system for crisis control can be a tough sell for IT departments, said Schiff. "Can someone say, 'We need a server that's twice as powerful in case of a recall?'" he asked. "Management does not want to hear bad news."

But trying to assemble a CRM system after a disaster hits, like with the Tylenol cyanide scare years ago, isn't a good idea, said Bob Zurek, an analyst at Cambridge, Mass.-based Forrester Research Inc. The call center staff has to be trained and the CRM data has to be prepped to create integrated customer profiles, or it won't work. "Remember, the competition is just a click away," Zurek said. ▀

If we had not had the [CRM system in place], we would have had additional costs in extra manpower.

LARRY MIMS, CENTRALIZED SERVICES TEAM MANAGER, MICHELIN NORTH AMERICA

Expectations Divided on Oracle's AppsWorld

OAUG charges that conference is just a marketing tool

BY MARC L. SONGINI

Users hoping to get the low-down on Oracle Corp.'s new products and its vision for the future will be heading to New Orleans this week for the company's first U.S. AppsWorld conference, which kicks off today with a keynote speech by former President Bill Clinton.

But if Oracle's European AppsWorld, held last week in Paris, is any indication, the show won't get high marks from Beth Barling, an analyst at AMR Research Inc. in Boston.

"Oracle admitted that Paris was a dry run for New Orleans, and from our perspective, dry was the word," she said. "[There was] little news or vision beyond a barrage of marketing messages that were already well known."

Oracle refused repeated requests from *Computerworld*

for comment.

The show has caused a major rift between Oracle and the independent Oracle Applications Users Group (OAUG), whose members maintain that AppsWorld is nothing more than a marketing tool. OAUG turned down a request from Oracle to fold its twice-a-year conference into AppsWorld. Instead, members said they would prefer to have an independent show devoted to educating users about Oracle products.



WILL BILL CLINTON'S keynote help foster AppsWorld credibility among Oracle users?

While some users will be able to get insight into industry direction and see new products, said Donna Rosentrater, an OAUG board member not attending AppsWorld, "I still haven't seen many how-to presentations on the agenda."

OAUG users have been clamoring for support when upgrading to Oracle's new E-Business Suite 11i software from previous versions.

Rosentrater said that until her company can get 11i up and running safely, she "cannot reap the benefits of the 'new world' of e-business" that Oracle plans to showcase at AppsWorld.

Doug Allen, CIO at Host-Centric Inc., a Houston-based Web hosting firm using Oracle to tie together its business processes, does plan to attend the conference. He said he's particularly interested in seeing a preview of some collaborative sales modules. "This is a good opportunity to see the up-and-coming products we don't have implemented and how they would be working in our business," he said. ▀

Can Napster Be Stopped by the Courts?

Music-swapping technology may be too pervasive for law to contain, say analysts

BY MICHAEL MEEHAN

Even if the the Recording Industry Association of America (RIAA) manages this week to shut down online music-swapping service Napster Inc., it may find that it can't stop rock 'n' roll. At least not when that rock 'n' roll is being disseminated over the Internet, according to legal experts and industry observers.

The U.S. Court of Appeals in San Francisco last Monday upheld an injunction that would shut down Napster before a suit brought by A&M Records is heard on its merits. The San Mateo, Calif.-based Web site may have to cease operations as soon as U.S. District Court Judge Marilyn Hall Patel reworks her injunction against Napster.

Napster officials have vowed to "pursue every avenue in the courts and the Congress to keep Napster operating."

Yet, Napster is just one of many sites that allow electronically copied music files to be swapped. Jeff Joseph, vice president of communications at the Consumer Electronics Association (CEA) in Arlington, Va., noted that those sites can operate well outside the jurisdiction of U.S. copyright laws if they choose to do so.

"[The RIAA] may have achieved a legal result that's unenforceable," said MIT associate professor Jim Short. "It's a bit like citing them for jaywalking."

Short said he believes the music industry and the courts have yet to grasp "the enormity" of the technological issues that exist in the Napster case.

"The [RIAA] doesn't understand how to effectively employ this new technology, and they're resisting a change in their business model," Short said. "Even if they do adopt this technology, it's probably not one they're going to be able to control."

And there's the rub: Music has become nothing more than an electronic file that can shipped over an Internet line. What was once proprietary

merchandise is now data in a world built for the ready transmission of data.

"Not only is the genie out of the bottle; the bottle's broken," Joseph said.

Enforcement Issues

The CEA lobbies for the U.S. consumer electronics industry and has almost 600 members, including Sony Electronics Inc., Intel Corp., Compaq Computer Corp. and Cisco Systems Inc. In August, CEA filed a protest

against Patel's ruling, calling it out of touch with the reality of an Internet-driven economy.

"If you look at any consumer electronic product, the key is access to content," Joseph said. "Take that away, and you'll have a chilling effect on innovation."

Elizabeth Fleming, an attorney at Washington law firm Preston Gates Ellis & Rouvelas Meeds LLP, said U.S. copyright laws make no distinctions between music recorded on CD and music that is electronically distributed. But she noted that not all nations have agreed to copyright protection provisions with the U.S.

If Napster or a similar ser-

vice wanted to place its servers in a nation that didn't recognize U.S. copyrights, then the RIAA would have few legal avenues to enforce those copyrights.

Peer-to-peer service "is not a rocket science technology, by any stretch of the imagination," Short added. "You can set these things up just about anywhere."

Motivated people find a way to get what they want, Short said.

"The technology's out there, and it's not going to stop here," he said. "You can't make it go away. If anything, we're only seeing the beginning of this technology, and the more the industry tries to clamp down on it, the more it will spur the technology on." ▀

Napster Time Line

A brief history:

May 1999 Napster debuts.

December 1999 RIAA sues for copyright infringement.

July 2000 U.S. District Court Judge Marilyn Hall Patel rules that Napster must remove all copyrighted material from its site. Napster appeals.

October 2000 Napster announces an agreement to create a fee-based service with recording company owner Bertelsmann.

February 2001 U.S. Court of Appeals upholds Patel's injunction. Napster vows to continue legal fight.

DOJ Investigates Microsoft's \$135M Investment in Corel

A Corel user, DOJ has stake in outcome

BY PATRICK THIBODEAU
WASHINGTON

An end user with a very big stake in the future of Corel Corp. — the U.S. Department of Justice (DOJ) — is using its legal powers to probe the antitrust implications of Microsoft Corp.'s recent \$135 million investment in the struggling software vendor.

Officials at both Microsoft and the DOJ last week confirmed that the agency is seeking documents related to the investment deal and strategic alliance that Microsoft and Ottawa-based Corel signed last October. The two office software rivals said the agreement signaled the start of increased collaboration, including joint development, testing and marketing initiatives.

The DOJ is looking into "the competitive effects of the transaction," said agency spokeswoman Gina Talamona. However, she declined to comment on the scope of the investigation or when the DOJ began its probe of the deal.

Microsoft spokesman Jim Cullinan said DOJ officials made "a narrowly focused re-

quest for information" about the deal. "Nothing in our investment in Corel should raise any legal concerns, but we are cooperating with the Justice Department to provide them with the information they've requested," he added.

Corel's WordPerfect suite of office applications competes against Microsoft Office, but market research firm IDC in Framingham, Mass., said Mi-

An End User With Clout

What happened? In October, Microsoft made a \$135 million investment in operating system and applications competitor Corel, which makes WordPerfect, a Linux operating system and other business and graphics applications.

What's the problem? In January, Corel said it may spin off its Linux operating system business. It also said it would focus on taking care of existing WordPerfect customers and not on building its customer base. Microsoft said its deal calls for .Net cooperation and nothing else.

What's the DOJ doing? It wants to see if antitrust rules have been violated. The DOJ may be one of Corel's biggest customers, with a WordPerfect enterprise license for more than 35,000 workstations.

crosoft controls approximately 94% of the word-processing portion of the market.

However, the DOJ is a major WordPerfect user: In 1999, it bought an enterprise site license that covered the installation of Corel's software on a total of 35,886 PCs. That contract runs for three years, according to a DOJ official.

Some critics of Microsoft welcomed the DOJ's investigation of the Corel deal.

"Microsoft has market power in Office, and to invest in its only significant remaining competitor has got to raise questions," said Ken Wasch, president of the Software & Information Industry Association in Washington, which has filed briefs in support of the antitrust case against Microsoft.

Wasch called the request for information about Corel "a perfectly reasonable inquiry" into antitrust concerns. In particular, he cited a restructuring announcement made last month by Corel, in which the company said it will target WordPerfect at the current installed base and try to spin off its Linux operating system distribution division.

As part of the restructuring announcement, Corel CEO Derek Burney said executives at the company were "choosing not to go into a head-to-head battle" with Microsoft, because most users have selected the latter's office suite as a de facto standard.

But Cullinan said there was nothing in Microsoft's agree-

ment with Corel that asked the latter firm "to do or not do anything" with its products. Corel officials "can make their own decisions about what software they want to develop for what platforms," he said. The only exception, he added, was an agreement for Corel to develop software supporting Microsoft's .Net initiative.

In any event, Corel's Linux operating system efforts aren't making money, said Bill Claybrook, an analyst at Aberdeen Group Inc. in Boston. If Corel's Linux distribution plans are "the basis of [the government's] investigation, it's pretty shallow, as far as I'm concerned," he said.

WordPerfect is widely used by law firms that want to take advantage of formats that were developed specifically for attorneys. The Corel software remains the standard at Alston Hunt Floyd & Ing. But documents frequently have to be reformatted on Microsoft Word for use by the firm's corporate clients, said Herbert Chun, information systems director at the Honolulu-based law firm.

Because of that, Chun said he hopes Microsoft's investment in Corel will help improve integration between the two products. The deal should make Microsoft "more willing to share the code [needed] to make the translation more seamless," he added. ▀

George A. Chidi Jr. of the IDG News Service contributed to this article.

ASP Helps ERs Cope With Overcrowding

Provides capacity information via Net so hospitals can share information quickly

BY JULEKHA DASH

AT ANY GIVEN time, about 10% of the emergency rooms in northern Virginia hospitals are filled to capacity, according to Pat Walters, senior vice president at Inova Health System.

That can add up for a health care network like Inova, which receives 150,000 emergency room visits per year at its five member hospitals in Alexandria, Falls Church and Fairfax, Va.

But new technology may help hospitals better cope with overcrowding in emergency rooms.

Last week, Chantilly, Va.-based EYT Inc., formerly known as Ernst & Young Technologies, announced an application service provider (ASP) system aimed at helping hospitals communicate with one another and with emergency management service (EMS) agencies about bed capacity.

Better Information Availability

"It doesn't solve the problem of overcrowding, but it allows us to get better information on EMS systems [and] who has beds available," said Walters. Falls Church-based Inova finished beta tests of the ASP system earlier this year and plans to go live with it on March 1.

In the past, emergency room officials sent faxes to a county's EMS headquarters to share capacity information, said Walters. When the network's five hospitals go live, they will be able to go to a Web site and provide information on capacity that can be accessed systemwide.

The problem of overcrowding in emergency rooms has been a growing concern in the health care industry for years. The number of U.S. emergency departments decreased from 6,291 in 1995 to 4,995 in 1997, but emergency room visits

have increased from 89.8 million in 1992 to 100.4 million in 1998, according to figures provided by the American College of Emergency Physicians in Irving, Texas.

A Good Fit

An ASP model suits health care because of its rapid deployment and low cost, said John Madden, an analyst at Boston-based Summit Strategies Inc. "Hospitals don't want to have to implement complex applications themselves," he explained.

Inova, which began beta-

testing the technology last summer, is currently paying \$100 per month for the service.

"If [it] was complicated and expensive, I wouldn't have done it," said Walters.

Andy Feinstein, team leader of the EYT project, said that while the company hasn't yet determined pricing for the services, it will charge hospitals "well under" \$1,000 per month to use the software.

David Dodge, a systems engineer at MetroHealth Medical Center in Cleveland, said that in his organization, officials communicate emergency room capacity by phone. If that information were sent via the Internet, it would save time and could reach more people more quickly, he said.



NEW WEB-BASED technology gives hospital emergency room staffs an easy, inexpensive way to quickly check bed capacity at other facilities.

While reporting on the status of available beds is usually accurate, it's occasionally "delayed or confused," Dodge said. "[Sometimes] a change in status is not communicated to the dispatch teams or other emergency departments."

Chris Coulter, business systems manager at Archbold Medical Center in Thomasville, Ga., said the technology

may be useful in a metropolitan setting, but it wouldn't be needed in a rural facility like Archbold, which is the only medical center in the community.

Mark Anderson, head of research at Stamford, Conn.-based Meta Group Inc., said EYT's application can be useful, but it isn't foolproof.

"[It's] only as good as the data," he noted. ▀

P&G Bandwidth to Benefit Not-for-Profit Neighbors

Firm hopes fiber-optic network will boost IT in hometown

BY JAMES COPE

Aiming to satisfy its own infrastructure needs and simultaneously boost the IT image of its hometown of Cincinnati, Procter & Gamble Co. (P&G) reported last week that it would begin construction of a metropolitan-area network.

The large consumer products company, known for brands like Tide laundry detergent and Crest toothpaste, is in the final stages of the engineering needed before beginning installation of a 60-mile optical network next month. The network will link P&G's seven corporate campuses in the Cincinnati metropolitan area, company officials said.

Jim Scholefield, data communications manager at P&G, said the project is a joint effort between his company and Cinergy Corp., also in Cincinnati.

Scholefield said he expects to "light the fiber" and go live with the network by the end of the summer.

Not only will the new optical fiber ring and its optical tributaries move P&G from 45M bit/sec. up to gigabit speeds, but they will also provide free bandwidth to nonprofit organizations such as Cincinnati State Technical and Community College, said Scholefield.

Several additional area organizations, yet to be named, can expect a fast and free ride on the P&G optical freeway too, according to company officials. These groups, like the college, will enhance the lifestyle of the community and contribute to the growth of e-commerce in the area, said Scholefield.

Ron D. Wright, president of Cincinnati State, said the gift of

bandwidth will enable his institution to better "prepare job seekers and incumbent workers for productive participation in the New Economy."

Building on a Strong Base

Scholefield stressed that because Cincinnati is home to telecommunications company Broadwing Inc. and its subsidiary Cincinnati Bell, the existing broadband infrastructure is already considerably better than that of many larger cities.

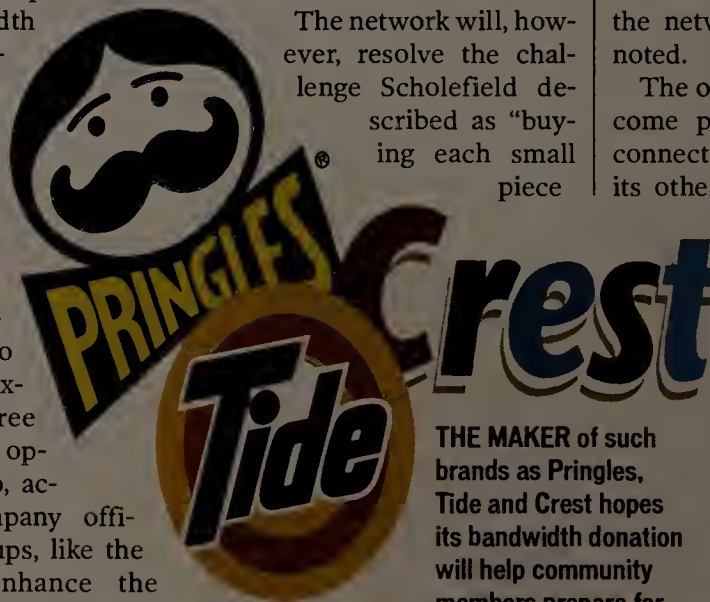
The network will, however, resolve the challenge Scholefield described as "buying each small piece

Scholefield said the new fiber ring is a "good financial deal" for P&G, but he wouldn't reveal the cost of the network. He did say, however, that the installation cost will be shared equally with Cinergy, which will do the actual fiber installation.

Scholefield said P&G will use the optical network for data, voice and video. Testing is already close to completion on IP telephones from several manufacturers, he said. IP telephony would be widely deployed over the network in the future, he noted.

The optical network will become part of backbone that connects P&G headquarters to its other facilities around the globe, Scholefield said. "Our regional and global hub routers are located in two different sites on opposite ends of the city," and the optical network will connect those, he explained.

Mary Regan, an analyst at The Yankee Group in Boston, said that P&G's approach is "innovative" and that she isn't aware of any other large companies taking this kind of community initiative. ▀



THE MAKER of such brands as Pringles, Tide and Crest hopes its bandwidth donation will help community members prepare for the New Economy.

of bandwidth as we need it," noting, "We'll be able to get as much bandwidth as we need out of the box."

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BRIEFS

Hotwire Adds Airlines, Rental Cars to Its Site

Hotwire, the new airline-funded rival to struggling Priceline.com Inc. in the online discount travel business, last week announced that 19 international airlines and two large rental car companies – Budget Rent a Car Corp. and The Hertz Corp. – have agreed to list available bookings on its Web site. The additions expand Hotwire's air travel offerings beyond the eight U.S.-based airlines that had previously signed up to use the San Francisco-based company's site. The airline and rental car deals follow Hotwire's rollout last month of a hotel room reservation service.

IBM Gets \$200M Nod From Kmart

Kmart Corp. last week announced plans to spend \$270 million to install new point-of-sale terminals and mobile computing technology in its retail stores as part of a two-year IT overhaul effort the company detailed last summer.

The rollout is beginning with a \$200 million purchase of Internet-enabled cash registers from IBM and a \$70 million installation of handheld computers and wireless LAN devices made by Symbol Technologies Inc. in Holtsville, N.Y. The deals with IBM and Symbol Technologies are part of the \$670 million IT investment Troy, Mich.-based Kmart outlined in July.

Microsoft Launches Outlook Mobile

Microsoft Corp. announced the worldwide beta launch of Microsoft Outlook Mobile Manager last week at DEMO 2001 in Phoenix. The desktop PC application extends Outlook messaging and collaboration to a variety of mobile devices, including text-enabled phones and handheld PCs. The beta version is available for free download at www.microsoft.com.

A note on the Web site says organizations must have the Simple Mail Transfer Protocol (SMTP) relay in the Microsoft Exchange e-mail server turned on for Mobile Manager to work. Some organizations have turned off SMTP for security purposes.

Telecom Industry Faces Massive Layoffs

As market values plummet, firms trim staff, shift focus toward new areas

BY JULEKHA DASH

COMPETITIVE pressures have prompted telecommunications firms to eliminate thousands of positions in recent months as they shift their focus to areas of higher growth.

Thirty-one Internet companies that specialize in telecommunications products and services have announced layoffs within the past six months, according to *The Industry Standard* magazine.

Verizon Communications in New York reported last week that it would cut 10,000 jobs through attrition and reductions in the use of consultants and the amount of employee overtime. And a week earlier, Milpitas, Calif.-based PCtel Inc. announced an 11% head-count reduction and a hiring freeze.

"My phone is ringing more often these days with candidates looking for positions," said Richard Murphy, a recruiter at Miami-based The Recruiters Group Inc., which specializes in the telecommunications sector.

Downward Trend

Brownlee Thomas, an analyst at Cambridge, Mass.-based Giga Information Group Inc., said that unlike last year, when the market values for these firms were soaring, many are now tanking along with the rest of the stock market. As a result, many telecommunications companies are laying off customer service representatives and low-level technicians, said Thomas.

At Verizon, about 1,500 employees will lose their jobs, but, in most cases, they will be given a chance to transfer to other divisions, said spokesman Peter Thonis, noting that areas such as data services are growing 30% per year vs. 3% to 4% growth for voice services. Bedminster, N.J.-based Verizon Wireless Inc. is also growing at

a clip of about 20% per year, said Thonis.

Sprint Corp. eliminated 200 to 250 jobs in the desktop services area in November but gave workers the chance to seek jobs in other divisions, said company spokeswoman Katrina Bawcom.

Wayne Mitchell worked at Sprint Enterprise Network Services in Dallas for about 18 months as a technical service consultant before he was laid off. He was offered another job, but it involved installing third-party software.

It "was not a challenging opportunity," said Mitchell, who is still unemployed but has

been talking with recruiters about jobs in systems administration and desktop and customer support. "I decided not to do that, [and then] the economy started taking a drop, and the opportunities dried up really fast."

The slump in the telecommunications industry seems to be hitting everywhere. Even big-name firms like Lucent Technologies Inc. have seen their share prices plunge. Last week, Lucent traded at less than \$15 per share; its 52-week high was about \$75 per share. The Murray Hill, N.J.-based networking equipment provider announced last month that it would eliminate 10,000 jobs.

While long-distance carriers AT&T and WorldCom haven't announced layoffs in recent

E-Florists Overwhelmed By Valentine's Day Crush

Download time suffers from volume

BY JAMES COPE

As online orders for Valentine's Day flowers blossomed last week, online florists found themselves struggling to keep up with huge increases in transaction volumes while customers were forced to practice patience, according to two Web site performance measurement services.

One site, San Diego-based Proflowers.com, was so overwhelmed with traffic that consumers had to wait 30 seconds or more just to download its home page, according to results released by Web measurement firm Keynote Systems Inc. in San Mateo, Calif. Officials at Proflowers declined to comment on the firm's Web site performance.



JOHNSON: FTD strives to optimize performance.

The big challenge for many online specialty retailers during holiday shopping bursts is having the ability to scale for big spikes in orders, said Neal Goldman, an analyst at The Yankee Group in Boston. Being able to scale from, say, 1,000 transactions per day to 100,000 "isn't all that easy," he added.

A spokesman for 1-800-Flowers.com Inc. in Westbury, N.Y., said it handled tens of thousands of orders each day during the holiday period, but he wouldn't comment on the company's Web site performance.

But if the Keynote statistics are any indication, 1-800-Flowers struggled to keep pace during Cupid's crush. According to the survey, the average amount of time needed to download the online florist's home page using a T1 line increased from 1.77 seconds on Feb. 11 to 4.99 seconds one day later.

Disconnected

Recent head-count reductions in telecommunications:

When: February
Company: Nortel
Reduction: 10,000 workers

When: February
Company: PCtel
Reduction: 11% head-count reduction and hiring freeze

When: January
Company: Lucent
Reduction: 10,000

When: November and December
Company: Covad Communications
Reduction: 800 workers

months, they, too, have been experiencing sagging share prices.

"They're trying to convince shareholders that they're a New Economy company," said Thomas. "They are under tremendous pressure to be all things to all people." ▀

SolidSpeed Networks Inc. in Ann Arbor, Mich., which measures site performance through a program installed on thousands of end-user PCs, reported that 1-800-Flowers averaged 2.05 seconds on home page downloads last week.

There was at least one notable discrepancy between the results posted by the two measurement firms. SolidSpeed reported a home page download time of 1.77 seconds for Proflowers.com, compared with Keynote's reading of 30 seconds. Goldman said these differences could result from different measurement methods or even a glitch in the measurement software.

But some sites held up well despite heavy transaction periods last week. For the one-week period prior to Valentine's Day, Keynote reported that FTD.com Inc. in Downers Grove, Ill., led the pack by averaging just 1.68 seconds for its home page to fully display on a visitor's screen using a T1 connection.

FTD.com CIO Fred Johnson said his company works hard to optimize site performance. For example, the group uses technologies from F5 Networks Inc. in Seattle to balance customer requests across multiple Web servers. ▀



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Big Companies Shy Away From Safe Harbor Accord

But European data-protection agreement gets push from Hewlett-Packard signing

BY PATRICK THIBODEAU
WASHINGTON

HEWLETT-PACKARD Co. last week signed up for the European/U.S. safe harbor program, making it the largest company to do so and providing the struggling privacy effort its biggest boost yet.

The technology giant also said the safe harbor privacy protections would be applied to all of its data transactions, lending credence to the idea that the accord may help strengthen privacy standards in the U.S.

The safe harbor agreement provides a manageable "legal and ethical" means to move data between two continents, said Barbara Lawler, HP's consumer privacy manager.

"If corporations are serious about following the self-regulation approach [on data privacy] rather than having to deal with privacy regulations, then this is what they should be looking at," she said.

Some Decide to Wait and See

But to date, only 21 companies have signed up for the voluntary safe harbor certification program, which provides legal protection from Europe's tough data-protection laws for U.S. companies that transfer information about individuals out of Europe. Companies that sign up for safe harbor must agree to adhere to a set of privacy protection rules.

Most of the companies that have signed up, with the exception of HP and Murray Hill, N.J.-based The Dun & Bradstreet Corp., are small to medium-size firms. Larger, Fortune 500-type firms "are investigating their options or taking a wait-and-see approach," said Jeff Rohlmeier, a trade official at the U.S. Department of Commerce.

U.S. companies have been "sort of reluctant to be first out of the box" to participate in the safe harbor agreement for fear

of being singled out by European authorities, said Barbara Wellbery, who was the principal negotiator of the agreement while at the Commerce Department.

"So the more big companies on the list, the better," added Wellbery, who's now an attorney at Morrison & Foerster LLP in Washington.

But Jean Cantrell, Dun & Bradstreet's director of government affairs, said the company has realized immediate benefits by agreeing to the safe harbor. For example, by consolidating a U.K.-based data center with one in New Jersey,

the company was able to save a significant amount of money in legal expenses by gaining a waiver for the data transfers under the safe harbor agreement. "I think [the accord is] working in terms of its objective," she said.

The clock, however, is ticking on the agreement.

The U.S. and European Union safe harbor agreement took effect last November, and European authorities plan to review U.S. corporate compliance this summer — and possibly begin enforcement actions soon after, say people familiar with the process.

But the safe harbor pact isn't the only option for companies that want to comply with Europe's data-protection laws. Companies can use a "model

contract" that guarantees adherence to Europe's data-protection laws. The contract must be signed by either a country's data-protection authority or by an individual whose data is being transferred.

The model contracts are be-

ing negotiated by European data-protection authorities and the Commerce Department, and a final version may not be ready until June, an agency official said.

Plus, the model contracts may turn out to be a less-desirable option than the safe harbor agreement because it's possible "that the standards will be tougher," said Donald Harris, president of HR Privacy Solutions, a consulting firm in New York. ▀

Safe Harbor Alternatives

Companies that apply for safe harbor agree to give European Union residents certain data-privacy protections, including notice about how their personal information is used, the ability to limit disclosure of that information and access to the data. But that's not the only option for complying with Europe's laws. Others include:

Model contracts: Contracts signed with European data-protection authorities. European authorities and the U.S. Commerce Department are negotiating a model contract.

Individual contracts: Agreements reached between companies and individuals about data transfers.

Tax Moratorium Helps ISPs, Does Little for E-Commerce

States, e-retailers seek simpler rules

BY PATRICK THIBODEAU
WASHINGTON

A new push began this month in Congress to extend legislation that is widely known as an Internet tax moratorium. But despite that moniker, the initial legislation hasn't had a significant impact on e-commerce except in one area: It stops states from imposing sales tax obligations on Internet service providers (ISP).

The two lawmakers who championed the legislation, Sen. Ron Wyden (D-Ore.) and Rep. Christopher Cox (R-Calif.), recently introduced a bill that would extend the ban on new and discriminatory Internet taxes — meaning ones that single out e-commerce transactions and aren't applied in the physical world — for another five years beyond its scheduled expiration in October. It would make the ban on taxing Net access permanent.

Other than the prohibition on new Internet access taxes, the legislation's impact has been largely "symbolic," said Karl Frieden, a partner at Chicago-based Arthur Andersen and an Internet taxation expert. "It sent a message that Congress was extremely concerned about taxes on the Internet and [that it] wanted no new taxes." Otherwise, the leg-

Tax Freedom

The Internet Tax Freedom Act took effect in October 1998 and expires this October.

WHO IT HELPED: It banned sales taxes on Internet service providers, except in states already charging sales tax.

NEW ISSUE: So-called "bundled" services such as telephony and music, which may be included as part of an Internet-access charge, may also be exempt from sales tax.

islation reaffirms existing tax law, he said.

The key issue in the Internet tax debate concerns the collection of sales taxes by remote sellers. Two previous Supreme Court rulings blocked a state from forcing remote sellers to collect those taxes unless the seller has a physical presence in the state.

Even though the moratorium legislation has had no impact in that area, it nonetheless remains at the heart of the remote sales tax debate. Many states and brick-and-mortar retailers say what they want in any new moratorium legislation considered by Congress is language that supports the idea of a universal tax collection obligation for all sellers, provided that the states simplify and reduce the administrative burden of tax collection. Thirty-one states are now working on a tax simplification project.

As filed by Wyden and Cox, the legislation "falls far short of what we are looking for," said James Goldberg, Washington counsel at the North American Retail Dealers Association, a Lombard, Ill.-based trade group that claims that the current sales tax system is unfair to companies with widespread brick-and-mortar locations.

But others contend that the

brick-and-mortar retailers are the ones that are seeking an edge in the tax debate.

The "big-box" retailers such as Bentonville, Ark.-based Wal-Mart Stores Inc. "would prefer to load up the [pure-play online retailers] with as much administrative burden as they can, so they can gain a competitive advantage," said Mark Nebergall, president of the Software Finance and Tax Executives Council, a Washington-based association of software vendors and IT consulting firms that supports the moratorium on new Internet taxes.

Meanwhile, eight states that were collecting sales taxes from Internet service providers before the act took effect in 1998 were allowed to continue to do so under the moratorium's grandfather clause.

The collection of a sales tax isn't keeping people from using Internet services in Tennessee, one state that applies sales taxes on Internet access, said Gregg Harper, a regional manager at Duro Communications Inc., a large, privately held access provider in Cassleberry, Fla. Tennessee charges an 8.25% sales tax but doesn't have an income tax.

"We're thankful we don't have to pay an income tax yet," said Harper. ▀

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BRIEFS

Nortel Expects Loss,
Will Cut 10,000 Jobs

Nortel Networks Corp. last week warned that it expects to report a first-quarter loss because of delays in spending by U.S.-based customers and said about 10,000 employees will be cut from its workforce this year as a result of the lowered outlook. The Brampton, Ontario-based networking equipment vendor also sharply reduced its revenue and earnings growth projections for the year. Nortel previously said both revenue and earnings were expected to increase 30% on an annual basis, but it's now forecasting growth of 15% and 10%, respectively (see page 10).

Congress Addresses
E-Commerce in Bill

The National Institute of Standards and Technology in Gaithersburg, Md., will look at supply-chain, e-commerce-related interoperability issues faced by small and medium-size businesses under a bill approved by the House last week. The legislation would create an advisory panel to look at the challenges of integrating e-commerce technologies as well as establish a grant program to help small businesses. The bill was sent to the Senate.

Sun Developing P2P
Program Language

Sun Microsystems Inc. said it's developing a Web-based programming language called Juxtapose for use by companies looking to build distributed peer-to-peer computing applications. Sun said its initial goal is to provide a simple code layer that software developers could use to write peer-to-peer applications with interoperability capabilities.

Short Takes

LM ERICSSON TELEPHONE CO. and IBM will join forces to deliver financial services over wireless networks. . . . HEWLETT-PACKARD CO. last week met lowered expectations, announcing a profit of \$727 million on revenue of \$11.9 billion for its first fiscal quarter, which ended Jan. 31.

Automaker Drives
Wireless in Plants

Wireless technology is Ford's first step toward build-to-order systems

BY LEE COPELAND GLADWIN
SANTA MONICA, CALIF.

CITING POOR coordination between its production lines and its extensive supply chain, Ford Motor Co. last week outlined the business drivers for overhauling its manufacturing plants with wireless networks that should allow workers to call in automotive parts orders from the shop floor.

"We're trying to clean up our production lines," said Jim Buczkowski, director of manufacturing and supply-chain systems at the Dearborn, Mich.-based auto giant. "If you pile up inventory all

over the place, it's more difficult to control what's going on."

Controlling line movement and reducing inventory levels are top strategic initiatives for the nation's No. 2 automaker, said Buczkowski last week at Forrester Research Inc.'s Automotive Summit here.

But perhaps more important, Ford's wireless overhaul is the first step in a broader technology drive that's aimed at enabling build-to-order systems through which vehicle manufacturing gets initiated by actual customer orders instead of by forecasting, he said.

During the past two years, Ford has been implementing a wireless network called

e-Smart in 25 plants in the U.S., Spain and Belgium. E-Smart synchronizes in-plant parts replenishment activities on Ford's production lines and inventory bays, and with its suppliers.

When an inventory bin on one of Ford's production lines reaches a minimum level, a line operator simply pushes a call button that's located on either a piece of equipment or a nearby wall.

This action sends a 2.4-GHz wireless signal that triggers a request to the parts maker for materials such as a fender or ball-bearing supplier, and to the plant's internal inventory center. The system also sends periodic wireless updates to the network to help synchronize parts deliveries to both the plant and the assembly line. Ford tapped WhereNet Corp. in Santa Clara, Calif. to

Continued from page 1

Wireless

issued a formal ban, but John Linz, acting director of the airport's IT division, said he would deny any requests for installation of wireless LANs or cellular phone microcell sites within the airport until BWI has a contract in place for a third-party provider.

BWI took the step to prevent interference with air traffic control and security systems, eliminate signal interference between wireless LANs and maximize revenue. According to Mike Beeler, assistant vice president of business development at MobileStar Network Corp. in Richardson, Texas, maximizing revenue from phone-toting travelers who no longer use pay phones is another airport concern.

"We had an installation in Atlanta [temporarily] shut down last year . . . and in a meeting [there, we] were told [the airport operators] are losing \$7 million a year in revenue from pay phones due to cell phone use," Beeler said.

Dylan Brooks, an analyst at Jupiter Media Metrix Inc. in New York, said, "Every airport is trying to figure out how to get a cut of the revenue" from wireless, with the drop in their share of pay-phone revenue definitely playing a part in the decision to target wireless.

Putting the same restrictions on public-access wireless LAN carriers and cell phone companies "means wireless LANs will suffer," Beeler said. That's because wireless LANs, with their low power output, have to be in the airport, whereas cell carriers "can just put up a tower outside the airport" and still get adequate coverage, he added.

Linz said generating revenue was part of BWI's plan. But "we see this as a major safety initiative," he added. Linz said a neutral third party, such as established aeronautical services company Arinc Inc. in Annapolis, Md., would better serve customers.

Compounding the problem are the airlines, which are in a race to provide wireless Internet access for their customers. American Airlines Inc. in Fort Worth, Texas, last year signed

a deal with MobileStar to install wireless LANs in 49 airports. Delta Air Lines Inc. in Atlanta is looking for a partner to deliver broadband wireless service at major hubs this year.

There is concern that publicly managed airports can't move fast enough for the airlines. But BWI said it will award a contract for its wireless LAN within three months.

BWI's intention to manage cellular phone installations caught that industry unaware. But a spokeswoman for New York-based Verizon Communications said the company could serve airports with off-premises towers because "our technology has become more sophisticated."

Beeler said the cell phone carriers and the wireless LAN industry have more than BWI to worry about, with airports in Minneapolis, Detroit, Chicago, Los Angeles, Nashville and Charlotte all in the process of defining policies to control all wireless communications, including cellular phones, at their facilities. ▀

Reporter Michael Meehan contributed to this report.

AT A GLANCE

No Wires
Attached

Ford's e-Smart plan:

- Ford has implemented e-Smart in 25 plants in the U.S., Spain and Belgium.
- A 2.4-GHz wireless signal from inventory bins triggers a materials request, such as a fender, to parts makers and to the plant's internal inventory center.
- Line operators can trigger the call button; the system also automatically sends updates on its own.
- Santa Monica, Calif.-based WhereNet Corp. developed the infrastructure for the wireless tracking system.

develop the infrastructure for the wireless tracking system.

Dan Garretson, an analyst at Cambridge, Mass.-based Forrester, said better management of information should help Ford and other major automakers have build-to-order systems partially in place by 2003. The wireless, real-time feedback from the line improves supply-side planning by reducing the wait time for new parts, he said.

Detroit-based General Motors Corp. is also moving to a build-to-order model. Executives at the nation's top automaker, which cut its inventory levels from suppliers by 10% as part of a cost-reducing measure in December, cited the challenge of having to integrate its manufacturing plants and the parts shipping schedules of its suppliers as a major obstacle the company must tackle.

Step in the Right Direction

"We have to enable our back-end systems, the systems in the plant, from a lean manufacturing standpoint and line up our supply-chain pipeline and be more efficient," said Mark Hogan, president of e-GM, the automaker's business-to-consumer Internet unit.

Thilo Koslowski, an analyst at Gartner Group Inc. in Stamford, Conn., said initiatives such as e-Smart bring automakers closer to their goal of tighter integration with their suppliers.

"A lot of the communication between suppliers and automakers is over the phone and with fax," said Koslowski. "It's a small improvement, but they still have to solve the big supply-chain planning problem." ▀

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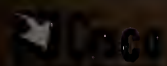
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App Center 2000 Ready to Ship

Server can help users manage Web apps

BY CAROL SLIWA

MICROSOFT CORP. last week added to the foundation of its enterprise software array with the release to manufacturing of Application Center, the last of the 2000 generation of its .Net server family.

Application Center 2000, available next month, aims to help users configure, manage, monitor and load-balance Web applications built on the Windows 2000 operating system.

"Now [Microsoft is] tackling these tough technical problems" in terms of what enterprise systems require, said John Mann, an analyst at Patricia

Seybold Group Inc. in Boston.

Companies face many choices when they build Web sites. Among the options, they can opt for large, scalable Unix boxes, or they can "scale out," using more of the less expensive Microsoft servers. With the latter approach, companies are sometimes left with a management challenge, because systems administrators typically have to tend to each server in a cluster separately unless they have created or bought special tools.

Application Center was designed to address that problem, enabling a company to manage a cluster of up to 12 servers as a single entity, said Microsoft

technical product manager Bob Pulliam. Firms with more servers can use a staging server to deploy applications to each of the clusters, he said.

"It is a limitation today," said John Enck, an analyst at Gartner Group Inc. in Stamford, Conn. "But I expect to see this product grow up in subsequent releases. I can't share the road map, but it's pretty impressive. Microsoft is investing in this product."

Yi Liu, an IT manager at San Francisco-based Embark.com Inc., a network infrastructure company catering to online higher-education admissions, said his company is already seeing benefits, operating with less staff because of Application Center. Liu said Embark had problems keeping its

servers in sync from a content and configuration standpoint using Windows NT 4.0 — particularly as site traffic spiked during December and January.

"We would take one of the servers off-line and essentially clone it," Liu said. "But we would have to do it when the machines were in a stable state, when we weren't making any configuration or content changes. Since we're constantly making changes, we would have to scale up in a very short time."

Now changes need to be made only in one place, since servers in a cluster are treated as a single entity. That also eases monitoring of the Web envi-

ronment. In the past, Embark used a third-party product and defined monitors for each machine individually. Now staffers can set up monitoring at the clustering level, which has helped them expand the scope of the monitoring they do and automate tasks to correct problem conditions.

With help from Application Center, Rosemont, Ill.-based Galileo International Inc., which provides electronic distribution services for the travel industry, can now test applications on staging servers before launching them into production, according to consulting engineer Justin Mette.

Beltsville, Md.-based Digex Inc., a managed-hosting provider for large enterprises, said Application Center will help customers design systems without single points of failure. "When one box goes down, we can put a new one in place and make this one look like the others in the cluster, and it will automatically be configured," said senior managing engineer Scott Turner. ▀

App Center Details

- ▶ Runs on Windows 2000 Server and Windows 2000 Advanced Server
- ▶ Priced at \$2,999 per processor
- ▶ General availability next month

Continued from page 1

Windows 2000

planning to roll out Windows 2000 later this year," said Mike Silver, an analyst at Gartner Group Inc. "Some enterprises really underestimated how much planning it was going to take. Some were under the Y2k hangover. They just weren't ready for such a project."

When the operating system hit the market last February, Gartner predicted that just 5% of Windows NT 4.0 servers would be upgraded to Windows 2000 servers over the course of last year. It forecast that the number would skyrocket to 40% in 2001. "So far, we've found [those estimates] to be fairly accurate," said Gartner analyst John Enck.

Research firm IDC in Framingham, Mass., reported late last year that while Windows 2000 adoption was progressing faster than it expected, Windows 2000 Server was experiencing "considerably slower growth" than Windows 2000 Professional, the desktop operating system. IDC noted that the trend was "not at all unexpected," since server migration

"is not a move that most IT managers make lightly."

"What we're seeing is the big push for Windows 2000 is going to come in the next six to 12 months," said Laura DiDio, an analyst at Giga Information Group Inc. in Cambridge, Mass.

One area that will continue to lag, however, is Active Directory deployment, DiDio predicted. A self-selecting survey that Giga conducted with Clearwater, Fla.-based Sunbelt Software — which drew more than 1,450 responses — showed that up to half of the IT professionals planning a Windows 2000 Server deployment this year are deferring Active Directory (AD) deployment indefinitely. Complexity and lack of trained IT staff were the chief reasons cited.

"People are putting [Windows 2000] Workstation on desktops in droves, but none of the ones I've seen are implementing [Windows 2000] Server with any seriousness. Most are horrified of AD, and rightly so. Look what NDS did to Novell," said Buck Woody, president of the Tampa Bay SQL Server User Group in Florida.

"Active Directory is a big chunk for people to swallow. It involves domain reorganiza-

tion. I haven't seen a lot of companies move to Active Directory yet," said independent consultant Bill Zack, the president of the New York Windows NT/2000 User Group, which has about 700 members.

Two user groups, in Charlotte, N.C., and Portland, Ore., didn't fit that pattern. Both reported that a majority of members had completed Windows 2000 client and server migrations and are using Active Directory in production.

Companies that made the switch to Windows 2000 have

cited performance gains, said Peter McKiernan, chairman of the New York E-Commerce Users Group and vice president of Stratis Group Inc., a consultancy in Murray Hill, N.J.

"The lowest we've seen is a 20% increase in performance," McKiernan said. "So most of our dot-com customers have made the migration to Windows 2000 at this point. The upgrade process is pretty straightforward."

Desktop migrations have lagged while many companies wait for the first Windows

2000 Service Pack. "Corporations don't jump. They move deliberately," Zack said.

Many users predicted that corporations also won't bite at the upcoming Windows XP client, formerly code-named Whistler, which Microsoft unveiled last week.

Bradley Dinerman, president of the Boston Area Exchange Server User Group, said most of his organization's 186 members are "focusing their energies" on Win 2k and "are not looking much further ahead than that." ▀

XP Aimed at Consumers

The new Windows XP operating system that Microsoft Corp. showed in Seattle last week targets consumers.

The upgrade is Microsoft's first operating system geared toward consumers that uses the same code base as Windows 2000, which the company aims at corporate users.

Chris Le Tocq, an analyst at Gartner Group Inc. in Stamford, Conn., said, "There's not a lot for IT here. There's no reason to delay Windows 2000 deployments because of this."

Windows XP will ship in the second half of the year. Pricing hasn't been set.

— Mark Hall



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Windows 2000 At One Year

After a year of cautious testing and planning, many users are just beginning major deployments of Windows 2000. By Robert L. Mitchell

A YEAR AGO, a survey of *Computerworld* readers found that the No. 1 thing they wanted from Windows 2000 was stability — no more blue screens of death. Now, on the operating system's first anniversary, IT managers agree that Microsoft has delivered on its long-overdue promise of reliability.

So today, after a year of tire-kicking, many IT managers are finally ready to begin production rollouts this year. Some are migrating eagerly to Windows 2000, some warily — especially since key tools are immature — and some are doing it only because they have to.

Penn National Insurance, for example, is just preparing to roll out Windows 2000 on its servers and desktops. But Jane Koppenheffer, CIO at the Harrisburg, Pa.-based insurer, says it wasn't the promise of higher reliability that clinched the decision.

"We are rolling out an imaging application that requires Windows 2000," she says. "If not for the external pressure from the application... we would probably not be moving as fast as we are today."

That kind of pragmatism — and the complexity of deploying the new operating system — are behind Windows 2000's slow march into the enterprise since its launch last February, say users and analysts.

IT managers who have worked with Windows 2000 — in test beds, in partial deployments and in full production rollouts — confirm that reliability has improved substantially. They're also experiencing better uptime due to improved handling of device drivers and dynamic link libraries and fewer administrative system reboots. The introduction of the Active Directory (AD) service has

eased some administrative headaches, IT managers say.

But implementing AD has been daunting. At a New York Windows NT/2000 users group meeting, *Computerworld* surveyed 70 IT professionals who came to hear a Microsoft Corp. consultant speak about AD. While more than half said they planned production deployments of Windows 2000 this year, only six anticipated having AD in place this year.

IT managers would like to see better tools for planning and managing AD, more device drivers and better middleware tools for moving data between Windows 2000 and other systems. And users still have concerns about whether Datacenter Server, Microsoft's enterprise version of Windows 2000, is stable and mature enough.

Users agree that this is the most reliable Windows to date. "Stability and reliability will be the two biggest gains," says Koppenheffer, who supports about 50 home-based users running Windows 95 and 98. She plans to begin migrating users this month.

Scott Newton, IT director

at baked goods company Otis Spunkmeyer Inc. in San Leandro, Calif., rolled out Windows 2000 on more than 600 workstations and 16 servers at 63 offices nationwide. He said he has seen a dramatic reduction in laptop support problems.

"Before deployment, laptops were a large part of our support. After deployment, those calls were reduced to simple things like 'I can't dial in.' The support time on calls has dramatically decreased," he says.

Mobile Stability

In addition to reliability and management improvements, Newton and others say they like the new features such as the Offline Files, a remote data replication capability that replaces the less-stable Briefcase applet.

"We have quite a few mobile users," says James Carbone, manager of IT infrastructure at New York-based Credit Suisse First Boston. "The biggest advantage is that you can disconnect from the network without having to shut down." Carbone is in the process of migrating more than 22,000 Windows NT 4 workstations and 3,000 NT

servers worldwide.

Initial users of Windows 2000 Advanced Server's high-availability features also give the product good marks. John

Loo, director of systems, network and engineering at Los Angeles-based television network E Entertainment Television, says, "We purchased a system dedicated to testing clustering, and so far, we've found no problems that haven't been documented."

He adds that on the client side, Device Manager (an applet that configures system hardware) "is a lot more stable and a lot more reliable. It seems to be smarter."

High End

Dave Maxey, systems manager at Hoffman Estates, Ill.-based Sears, Roebuck and Co., says he hopes to use Datacenter Server's multiprocessing and clustering technologies to consolidate 67 OS/2 file and print servers onto two servers.

"We spent most of the year in a pilot mode," he says. "We think that Datacenter Server will give us the most bang for the buck and take a lot of complexity out of the environment." Sears also plans an "infrastructure refresh" that will replace about 30,000 NT Workstation clients with new machines running Windows 2000 Professional, starting this quarter.

Application compatibility has also been good, but the required testing takes time. Carbone has extensively tested Windows 2000 with a few hundred applications, as well as Citrix Systems Inc.'s MetaFrame and storage-area network systems, and says, "It's looking pretty solid." But that's only in the lab. "When you put it out in production, that's when you face the issues," he explains.

Newton says it was the administrative benefits that drove him to migrate to Windows 2000 — a process that he started last February and concluded in June. "We've been able to cut down support

staff because of the centralized management of the servers," he says.

Newton cites the ability to remotely deploy new users and to use group policies to restrict users' ability to change the system configuration — something he never attempted under Windows NT because of the awkwardness of policy management under the NT domain model.

"You didn't have that capability in NT 4 without going into the policies within the domain. It was more cumbersome. It wasn't worth it," Newton says.

Both reliability and performance led Bernard Gay, vice president of enterprise technology and operations at Miami-based Royal Caribbean Cruises Ltd. to upgrade the company's two Web servers from Windows NT. "We've converted our booking engines on our Web servers and our back-end servers using Windows 2000 and SQL Server 2000," he says. "On the Internet Information Server side, we saw performance gains of 20% to 30%."

Unlike with Windows NT,



JENNY THOMAS

Windows 2000 Time Line: Since the launch of Windows 2000 in February last year, Microsoft has been busy introducing and announcing a host of new products that extend and build on the new operating system.

APRIL 1999 ■ Windows 2000 Professional Beta 3	FEBRUARY 2000 ■ Windows 2000 Professional: workstation ■ Windows 2000 Server: entry-level server; introduces Active Directory ■ Windows 2000 Advanced Server: clustering and multiprocessing support	AUGUST 2000 ■ Exchange 2000 Server: messaging and collaboration, first application to require Windows 2000 and Active Directory ■ SQL Server 2000: with XML support	SEPTEMBER 2000 ■ Windows 2000 Datacenter Server: enterprise level, with multiprocessing, clustering and load balancing; sold only by server vendors ■ Windows 2000 Service Pack 1 ■ Host Integration Server 2000: integration with older host systems	NOVEMBER 2000 ■ Commerce Server 2000: online business applications ■ SQL Server 2000, Windows CE	DECEMBER 2000 ■ Whistler Beta 1: next major release of Windows 2000; end of Win9x line; introduction of new 64-bit version ■ BizTalk Server 2000: XML-based business processes ■ Internet Security and Acceleration Server 2000: Firewall, Web caching	Q1 2001 ■ Application Center Server 2000: Application scalability, redundancy ■ SharePoint Portal Server: Document management ■ Whistler renamed Windows XP	Q2 2001 ■ Mobile Information 2001 Server: wireless access	2ND HALF 2001 ■ Windows XP is scheduled to ship
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Gay says, "the servers just don't crash," and he "doesn't run into memory contention issues as much." He says he plans to deploy Windows 2000 on more than 5,000 clients and 400 servers over the next two years.

Needs Improvement

Windows 2000 certainly has plenty of areas for improvement. Some users say they're still waiting for device drivers for printers and other hardware. And while Newton will use Windows 2000 for file and

print services, he hasn't put core applications on it.

"Putting our company on that for our main system — it's a little bit scary," he says. He plans to move to a new enterprise resource planning system but is cautious about moving it off his AS/400. Newton is interested in the multiprocessing and load-balancing capabilities of Datacenter Server, but he feels it's too early to commit. "We are a year and a half off from people developing the applications to reap the benefits," he says.

Users can only buy Datacenter Server bundled with system hardware from qualified vendors, which tend to offer it only on pricey, high-end systems. That makes testing the new operating system expensive, says Credit Suisse's Carbone, who is considering Datacenter Server for disaster recovery and business continuity applications.

"We would like to see a better middleware integration component," says Gay, who has many custom-developed applications and an IBM AS/

400 system running a DB/2 bookings database that must work with a Windows 2000 Web server and an SQL Server 2000 customer database.

"We have had to search high and low to find tools that move information between systems," he says. And "if you're planning on writing applications and you're not a homogenous [Microsoft] environment, there are some roadblocks when it comes to compatibility."

Directory Snags

Perhaps the most complex part of deploying Windows 2000 is creating and maintaining AD, an area in which users say more work is needed. Newton, for example, says he would like to see better tools for managing AD.

"You can find a device name now, but it doesn't tell you what container it's in, and you don't know where it is. It would be nice to have some simple reporting tools," he says. Newton is aware of third-party tools from companies like Santa Clara, Calif.-based NetIQ Corp. but says that some basic functionality should be included.

Penn National Insurance is struggling with its AD design, which won't come out until after the server rollout begins. "We're not a large organization or a small organization. We're caught in the middle," Koppenheffer says.

Dan Kusnetsky, an analyst at Framingham, Mass.-based IDC, agrees. "It's hard work to get AD set up the way they want it to be set up, and the [management] tools are primitive at this point," he says.

For Sears' Maxey, the issue is creating an AD that can sup-

port upward of 30,000 users while maintaining compatibility with the existing directory system. "We're working with other organizations to create an Active Directory to apply in all locations and that will integrate with our iPlanet LDAP [Lightweight Directory Access Protocol] on our Sun server in the distributed data center," he says.

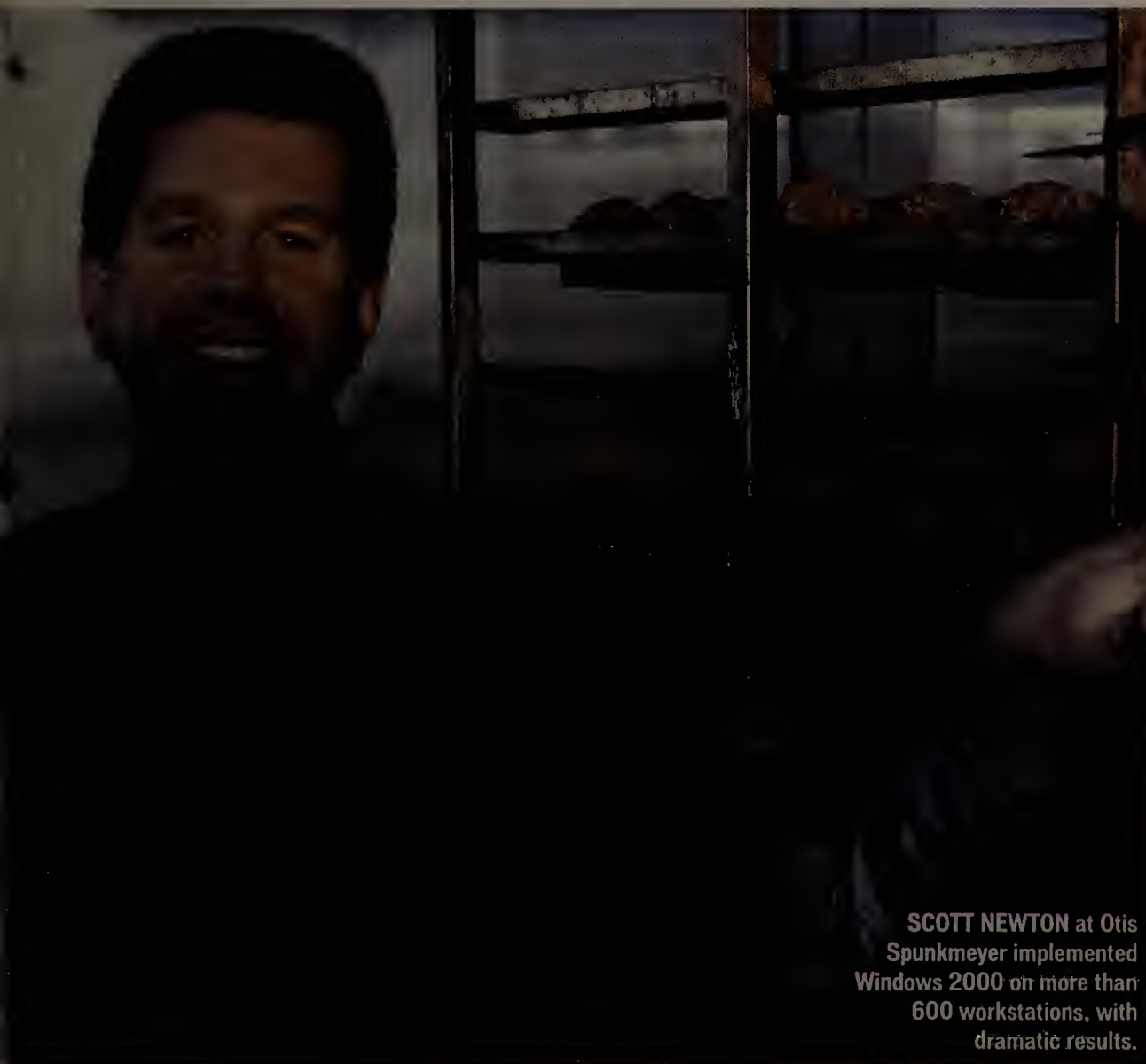
So far, the native tools for AD have been adequate, but Maxey cautions that Sears is just starting the process.

Others are less impressed. "Today, you can't back out an [AD] schema modification [that defines attributes for classes of objects in the directory]," says a Windows 2000 project manager at a financial services company in the Pacific Northwest who declined to be named. "It bothers me that you can't take that out." He also wants better tools for group policy management.

"There's no good way to search for a group policy that does what you need," he says. "You have to go through all 800 of them. There needs to be search tools."

Finally, users would like see more best practices and tools for managing migrations. Carbone notes that upgrading desktops and servers at Credit Suisse is no small undertaking. "The only thing that's drastically reduced is the scripting to get the applications down onto a workstation," he says, although "going from Windows NT 3.5 to 4.0 was much more painful."

Whistler, the next production release of Windows 2000, promises several new features on the desktop and server. The client, now called Win-



SCOTT NEWTON at Otis Spunkmeyer implemented Windows 2000 on more than 600 workstations, with dramatic results.

Windows 2000

dows XP, due later this year, includes a device driver roll-back feature, a remote-control help desk function and C2

level security. The server beta includes a long list of refinements, and a 64-bit version will be available to support Intel's Itanium systems.

"Changes in the server side are pretty significant, in terms

of what they're fixing in Active Directory," says Mike Silver, an analyst at Stamford, Conn.-based Gartner Group Inc. "They're doing something to fix group objects, the global catalog, making multiple

forests easier to manage."

IT managers are interested in Windows XP, but that's not stopping plans to deploy Windows 2000 Professional. Koppenheffer, who must support branch offices at Penn Nation-

al, says Windows XP's new help desk functions could be "a huge benefit for us," but she isn't holding off on Windows 2000 Professional. As for 64-bit computing, the applications will drive the decision.

"Most of our vendors indicated that 32-bit is where they're going to stay for the foreseeable future," Koppenheffer says.

E Entertainment is already running its Web site on 64-bit Unix and is interested in what Whistler has to offer. But Loo is taking a wait-and-see attitude. "We will have to evaluate it and see if it fits our business," he says.

Still, Whistler will be a key turning point for Windows 2000, says Tony Iams, an analyst at Port Chester, N.Y.-based consulting firm D.H. Brown Associates Inc. "The only thing that makes a system truly robust is maturity. They've put a lot of new functions into Windows 2000 — a lot of new code," he says. And as the next production release of Windows 2000, "It is an important breakthrough because you will have a more mature product," he adds.

Nonetheless, the stability of Windows 2000 is an improvement on NT 4 and a big leap over Windows 98 on the desktop, users say. And that, for some users, is reason enough to move forward. ▀

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Windows 2000 Pros and Cons

What users like . . .

- Greater reliability
- More uptime due to fewer administrative reboots
- More efficient, centralized management using Active Directory
- Ability to consolidate servers using clustering and multiprocessing features of Datacenter

. . . and what they don't

- Complexity of building an Active Directory
- Application compatibility testing process is slow
- Limited tool set for creating and managing the Active Directory
- Some device drivers are still not available
- Few middleware tools for migrating data between Windows 2000 and other systems



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Microsoft

BRIEFS

Microsoft Names New President and COO

Microsoft Corp. last week named Rick Belluzzo, a former CEO of Mountain View, Calif.-based Silicon Graphics Inc. and a Hewlett-Packard Co. veteran, as its new president and chief operating officer. Belluzzo, 47, succeeds retiring COO Bob Herbold, 58, who will stay on part time as a liaison to industry, government and customers. Belluzzo joined Microsoft in late 1999.

SAS President Steps Down After 6 Months

Data analysis software vendor SAS Institute Inc. confirmed last week that its president and chief operating officer has resigned after only six months in that job. Andre Boisvert's departure comes on the heels of the resignations of two other senior employees in the past month. Boisvert was originally hired last February to handle investments and acquisitions at Cary, N.C.-based SAS. He was promoted to president in September, taking over much of founder, Chairman and CEO Jim Goodnight's responsibilities and heading an effort to go public that was started several years before.

Short Takes

EMC CORP. confirmed it dismissed hundreds of workers earlier this month, but the Hopkinton, Mass.-based storage vendor said the move was part of a stringent and ongoing employee review process that doesn't necessarily involve reducing internal costs. EMC officials wouldn't specify the number of employees beyond saying that "several hundred" workers lost their jobs. . . . San Francisco-based **RIVERSOFT TECHNOLOGIES LTD.** has entered into an agreement with **CISCO SYSTEMS INC.** under which it will supply San Jose-based Cisco with a tailored version of RiverSoft Fault Manager software. The software will provide mobile wireless network management functionality to Cisco's 2.5G and 3G network offerings. . . . Houston-based **BMC SOFTWARE INC.** announced its acquisition of **PERFORM SA**, a French Web-based network optimization software developer.

'Virtual Close' Fails To Work for Cisco

Wall Street slaps Cisco for missing forecast as accounting process falters

BY JAMES COPE

INVESTORS CLOBBERED networking powerhouse Cisco Systems Inc. earlier this month, driving the company's stock down 16% when Cisco missed analysts' earnings forecasts by a penny for the second quarter ended Jan. 27.

It's usually the other way around.

San Jose-based Cisco typically beats Wall Street estimates by 1 cent, in part by using an accounting process that company President and CEO John Chambers calls the "virtual close." That process, according to Chambers, enables the company to keep such close tabs on its financials that it's able to close its books in a matter of hours and, when necessary, make quick course corrections to enhance earnings.

So why didn't it work this time?

Chambers said that while the virtual close lets Cisco look at the financial state of the company on a daily basis, it doesn't allow it "to predict the future." That's particularly true, he said, when dealing with macroeconomic trends, such as the current rapid slowdown in the overall economy.

"We started to see some initial softness [in product sales] the second week in December,

which continued throughout much of January," Chambers said, adding that sequential growth of 4% from the first quarter to the second quarter was somewhat troubling too.

"The challenge [in growth] was primarily in the U.S. alternative service provider market," Chambers said.

Alternative service providers include companies such as emerging competitive local exchange carriers that compete with the regional Bell operating companies.

Ironically, the service provider segment is where Chambers said he believes Cisco will realize most of its planned 30% to 50% annual growth rate. And it's that very focus that may adversely affect Cisco's

historical ability to change direction on a moment's notice.

Jim Slaby, an analyst at Giga Information Group Inc. in Cambridge, Mass., said the time required to close a big sale on network equipment to



CEO CHAMBERS: Service provider market is where Cisco will grow.

service providers may be as long as 18 months. That's three times longer than a typical sale to a corporate user, he said.

Moreover, selling to service providers isn't as predictable as selling to business users, because there's a lot more competition in the service provider segment, according to Slaby.

Cisco is well entrenched in the enterprise space, he added. But compared with Brampton, Ontario-based Nortel Networks Corp. and Murray Hill, N.J.-based Lucent Technologies Inc., Cisco is still a newcomer to the service provider market. Slaby also noted that dozens of start-ups are clamor-

ing for a piece of that pie.

Although Cisco's earnings may have been off a penny per share from Wall Street expectations, the networking company certainly isn't struggling.

Cisco reported Feb. 6 that net sales for the quarter were up by 55% at \$6.75 billion, compared with the \$4.36 billion reported for the same period last year. And pro forma net income was \$1.33 billion for the quarter, up 48% from the same period last year.

Chambers said the company could see a couple of soft quarters in the future. But as long as recessionary pressures in the U.S. don't migrate to Europe and the Asia-Pacific region, he said, Cisco should continue to enjoy a 30% to 50% annual rate of growth during the next five years.

Wall Street reaction isn't necessarily rational, said Michael Speyer, an analyst at the The Yankee Group in Boston.

Cisco is subject to economic slowdowns just like any other company, he said. "And even a slight deviation from expectation is more than the market can stand," said Speyer. ▀

MORE THIS ISSUE

For more on Cisco and the challenges it's facing, see page 28.

Key Executive Resigns From SAP America

BY MARC L. SONGINI

SAP AG last week confirmed that the president of its U.S.-based subsidiary has resigned, although the German software vendor didn't disclose any specific details surrounding his departure.

A spokesman for SAP America Inc. in Newtown Square, Pa., said Chris Larsen, who had been president of that unit since late 1999, resigned "to pursue other opportunities."

SAP America CEO Wolfgang Kemna is assuming Larsen's duties, the spokesman said, adding that SAP users shouldn't notice any difference in their dealings with the company during the transition.

Larsen is the latest in a string of high-level executives who have left SAP America within the past few years. For example, former CEO Kevin McKay resigned from the subsidiary

last spring and eventually took a job at Mercator Software Inc. in Wilton, Conn.

After Larsen became president, SAP America launched a major reorganization of its sales and service operations in what he said was an attempt to make them more "proactive" in dealing with users.

Larsen also oversaw the U.S. rollout of SAP's mySAP.com suite of Web-enabled applications.

Bruce Richardson, an analyst at Boston-based AMR Research Inc., said Larsen's exit wasn't particularly surprising. SAP wanted a German executive to run SAP America and tapped Larsen as president primarily as a gap-filling move, Richardson said. "They needed someone to stabilize the sales force,"

he added. "Once that happened, they didn't need a co-president [anymore]."

But Joshua Greenbaum, an analyst at Enterprise Applications Consulting in Daly City, Calif., said Larsen's departure



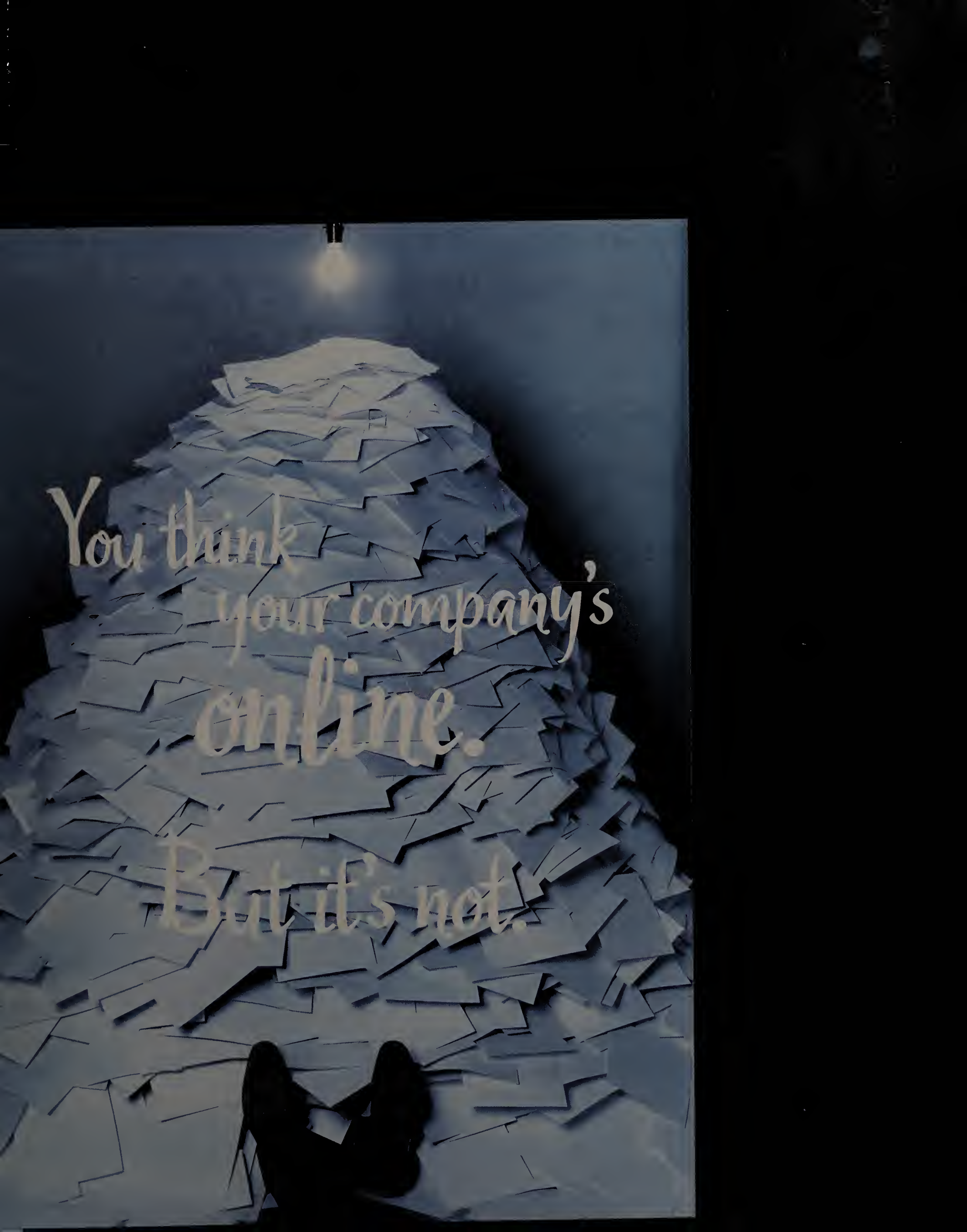
LARSEN: Goal was to stabilize sales force.

could be unsettling to some of SAP's users. "This is a time when SAP needs to be firmly in control and show a unified front, and it would be better not to lose this kind of senior person," Greenbaum said.

He added, though, that Kemna still gives SAP America a strong upper-management presence. And SAP seems to be doing well, from an overall U.S. sales perspective, according to Greenbaum. "This does not indicate some inner rot at the core of the company," he said. ▀

Even a slight deviation from expectation is more than the market can stand.

MICHAEL SPEYER, ANALYST,
THE YANKEE GROUP



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@ DLOWY

@ ELLEN

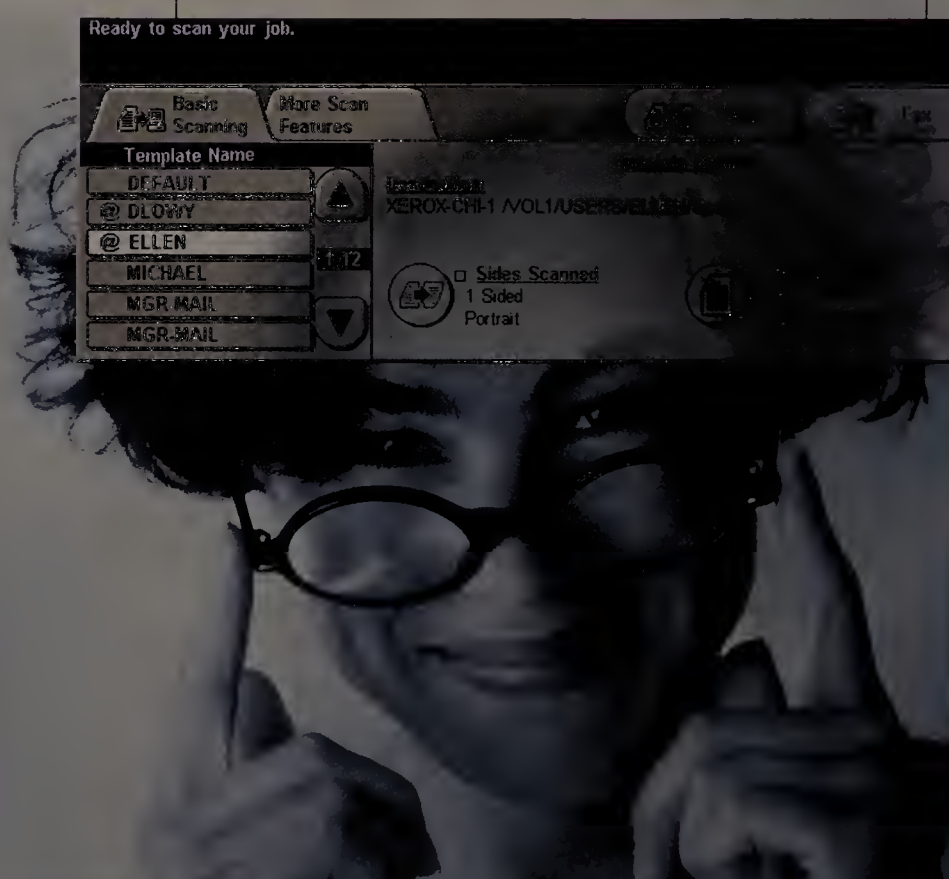
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the online world is now open for business.

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Going out to the hallway and scanning large documents into the digital stream at up to 65 ppm is certainly efficient, but the important question remains: Where is all that information going, and what can you do with it once it gets there?

☐ Document Centre lets you scan directly to industry-standard messaging and collaboration platforms

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or Domino.Doc.

☐ You can scan directly to a Web repository, so anyone has instant access to information from a remote location.

☐ Scan to your PC desktop, and with ScanSoft PaperPort and TextBridge software bundled with Document Centre, you can drag and drop your scanned image into any one of 150 industry-standard applications. You won't need to re-key your documents.

Scan 65 ppm

3 easy steps

- 1 Select scan folder
- 2 Select destination
- 3 Press green button

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Appletalk
Novell NetWare 4.X
PCL 6
Token Ring 14/16MB
TCP/IP
OS/2 WarpServer
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Adobe PostScript 3

☐ Or scan documents to the network, and using software like Xerox DocuShare, users can access them through any current Web browser on any platform. It gives you an electronic file cabinet that's a very efficient way to share knowledge and dramatically reduces e-mail traffic.

☐ Or combine Document Centre with Xerox FlowPort. FlowPort is a Web-based software platform that manages the flow of documents from paper to digital and back again in dramatically new

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☐ And when it comes to getting your digital documents back into paper form, Document Centre's open architecture supports all major industry printing standards and encourages third-party software solutions to thrive. So you can print not only from your desktop or from the Web, but also directly from your mainframe, including ERP applications like SAP.

☐ In short, things once limited to paper are electronically archived, accessed, shared and easily printed wherever you need them. It doesn't just increase productivity, it decreases costs and saves time. Turn the page to learn how one of our customers is already benefiting.

The Web

Microsoft Exchange
Public Folders

Lotus Notes

Xerox DocuShare

Lotus
Domino.Doc

PC Desktop

Paper or digital, it's about solutions that leverage the network.

We have hundreds of customers who report impressive results. But here's one in-depth story of how a Document Centre solution reduced one organization's work-cycle time from three days to just three minutes.

The Customer:

Center for Technology Management, in a prominent Midwestern research institute.

The Problem:

There are dozens of huge file cabinets overflowing with documents—patents, notes and contracts about inventions the university owns. Each year up to 1,500 new folders are added. Every day, dozens of people call and request files. By law, the university must provide public access to any of these thousands of complex scientific documents for reference, revision, notation or collaboration. And it must be done for 25 years. The commitment of time, space and personnel is large and growing.

The Solution:

Combine Xerox FlowPort and DocuShare with two Document Centres. This gives you a search engine for all your documents.

Now when people need a document, they just check off the file they need on a FlowPort cover sheet, scan it into the Document Centre, and FlowPort software finds and sends the requested electronic file to a server that can print, e-mail or store the document. What's more, once the file is stored, DocuShare lets you manage it on the Web, giving authorized users instant access for viewing, downloading and printing documents from anywhere at any time.

The Result:

A process that used to take three days can



now be completed instantaneously. Documents are accessed and shared electronically. Paper is eliminated while collaborative work processes are made simpler. Security is improved. Those 20 file cabinets are soon history. Costs are lowered. Time is saved.

Online or off, it's about a simpler way to share knowledge.

In a world of intranets and extranets, of e-commerce and the Internet, you need state-of-the-art technology and expertise to manage and share the documents that contain the knowledge in your organization. The Xerox Document Centre is a digital platform engineered from the ground up to eliminate the barriers between your paper and online documents.

Call us or visit our Web site for more information. And see how much you can increase productivity and control cost just by getting all your company's documents online.



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Product Quicktake

Spotlight on ProActivity for Business Process Discovery, Optimization and Management

Business process integration and management are becoming critical to e-business success. e-Business requires companies to shrink business cycles to respond quickly to new competitive threats and opportunities.

Sustainable competitive advantage in the e-business age requires continuous innovation, which in turn requires an intense focus on analyzing business processes and the impact of change.

ProActivity is the first tool we have seen that reduces the skills and time required to discover business processes. More important, it reduces the time that business experts need to be involved.

Organizations can benefit from using ProActivity in a number of ways. When used for defining integration requirements, ProActivity automatically creates the business process maps. Organizations will gain maximum business benefit and long-term competitive advantage from ProActivity by investing in enterprise process management. This requires dedicating resources to become experts in using the tool and working with business managers to define processes. Benefits will also accrue from the ongoing management of the process library by enabling reuse of models and analysis of the impact of business change. When ProActivity is used across the enterprise, organizations will gain insight into optimizing and innovating their business process and managing continuous business change.

Product Description

ProActivity solves a difficult business problem

by supporting the discovery, design, analysis and optimization of complex business processes.

e-Business solutions often cross organizational boundaries. The problem is that no one person understands all the details of the end-to-end process. ProActivity supports discovery and verification of all parts of the process and ensures that the end-to-end process is complete and consistent.

Built on a set of patented algorithms, ProActivity guides the discovery of complex business processes and automatically builds process models that can be viewed from various dimensions with the click of a mouse. While business process management and workflow tools are becoming very important for e-business solutions, those tools support graphical depiction and automation of the process. They do not necessarily reduce the time or skill sets necessary to discover and analyze the process.

ProActivity does, and it can be used to create business process models that can be exported to XML through its application interface for use in other process automation tools.

ProActivity supports the process life cycle and helps ensure a complete design. In the discovery stage, ProActivity guides the process of efficiently extracting information from those who have knowledge of different parts of the business process, stores the pieces of the process and ensures the design is complete and consistent. The process models generated include business process views as well as system-level views. These help business people understand and verify the business process. The models can be used in the deployment stage to define the system and integration requirements. ProActivity



ProActivity Inc. *at a glance*

Product name: ProActivity
Type of product: Process Discovery and Management

Address: 181 Wells Avenue
Newton, MA 02459

Phone: (617) 332-0095

Fax: (617) 332-0295

Web site: www.proactivityinc.com

Founded: 1998

Ownership: Private, venture-backed with \$10 million

Total employees: 50

Total in service/support: 16

Total in R&D: 20

Number of customers: 10

also supports impact analysis of dynamic views, enabling companies to optimize configurations before the system is implemented. It also supports impact analysis of process changes. The repository in ProActivity includes information on data processing activities, business objects, data flows, roles and resources. ProActivity creates process blueprints as well as business-level reports, including how many activities a person performs in a given process. Additional processes and systems can be easily added and analyzed. This enables ongoing process innovation and reduces the risk of creating incomplete or inconsistent e-business specifications.

CUSTOMER FEEDBACK

The customers we spoke with all felt that ProActivity provided information on business processes they could not obtain in other ways. One customer compared designing a system without ProActivity to driving in the fog with a dirty windshield: You just don't have the same visibility, and you're likely to miss something. Another Fortune 500 customer plans to systematically document all the company's processes in ProActivity and provide the same level of management for enterprise processes as is currently provided for data management. This customer is convinced that the ability to view complex processes from multiple viewpoints and assess the impact of change will provide substantial competitive advantage and return on investment.

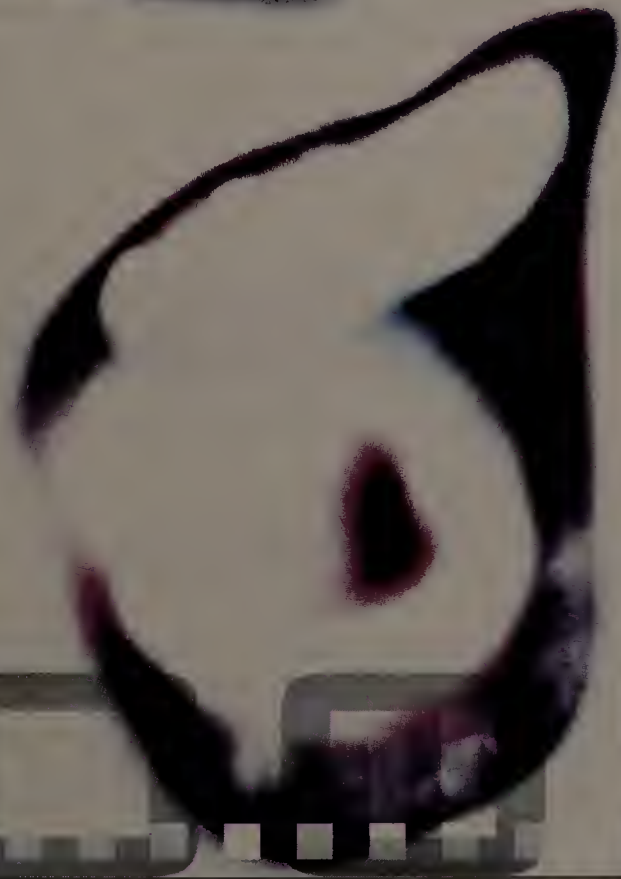
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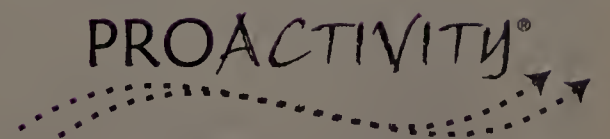
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WE SPEAK THEIR LANGUAGE



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LIKE THEY'RE OPERATING IN **PARALLEL UNIVERSES**.

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www.proactivityinc.com

PATRICIA KEEFE

Russia Gets IT

SOMETIMES THE BEST THING to do when you are so far behind you can't possibly catch up is to leap forward. In a big, splashy way.

I recently spent a week in Russia talking to IT managers and business strategists about the challenges they face as their country gingerly plots its path through the open market. You

can guess at some of their obstacles, but you might be surprised at how well positioned they are to move ahead. It may take the Russians a while longer — OK, maybe a lot longer — to grasp customer service, but they get the value of aligning IT with the business strategy. And they are doing so with highly skilled IT labor, at a fraction of the cost borne by Western competitors. This is critical in a country struggling to catch up with the West on multiple fronts.

The IT managers I talked to at some of Russia's leading commercial entities made it clear that they aren't sitting in some back room waiting for orders and the rubles with which to carry them out. They're making the decisions and getting the funding somehow.

Nor are they starting with the basics. There's no point.

The knee-jerk tendency is to dismiss the former Soviet states as a technological backwater — and to some degree, that's true. The percentage of people who own their own computers or who regularly visit, never mind transact on, the



PATRICIA KEEFE is Computerworld's editorial director. Contact her at patricia_keefe@computerworld.com.

Internet, is still tiny. (Which explains in part why the B2B revolution will precede B2C in Russia.) It's only within the past 10 years that Russian banks literally retired their abacuses and automated routine transactions, and it's true they're still wiring the country — though with fiber optics and satellite communications.

This state of virginal automation combined with a highly trained IT workforce is actually Russia's ace in the hole.

It's a free pass to leapfrog over the legacy infrastructures that Western companies and governments constantly trip over, and it's what will enable the Russians to at least catch up technologically sooner than we'd expect. They may even forge ahead in some areas where they're free to install the latest technology. They have an opportunity to think big, and they know it. It may take the country a while to amass the commercial know-how and mind-set needed to become a global, economic powerhouse, but you can be sure the IT side of the house will have done its job. ▀

PIMM FOX

Is Cisco Transmitting Ominous Signs?

WHEN CISCO SYSTEMS, a bellwether for all that's technology and Internet, announced this month that it missed its Wall Street estimates, CEO John Chambers cited a slowing economy and — in particular — deteriorating sales to telecommunications carriers. In a conference call with analysts, he also said falling sales to dot-coms (about half of last year's level) and budget cuts at some of its large customers in manufacturing were reasons Cisco missed earnings estimates by a penny per share.

All this may be so, but Cisco's real problem is that it competes in many different networking markets, diluting its effectiveness in its core router technology.

In the 1990s, almost all of Cisco's revenue came from selling routers, and it had a stranglehold on the market. But in 1997, the company made more money from sales of nonrouter products than from routers. Cisco moved into the voice over IP market in 1998 with the purchases of Precept Software, Summa Four and Selsius. Cisco powered into fiber-optic equipment, buying Skystone Systems and Pipelinks, and in 1999, it paid \$7 billion for Cerant. It bought WheelGroup and Global Internet Software for the encryption and security market.

In the meantime, competitors lined up to take pieces of Cisco's once-core business: selling routers to Internet service providers and telecommunications carriers.

Throughout the 1990s, Cisco's Internet Operating System (IOS) was the lingua franca for moving large amounts of data through the pipes of companies such as Qwest and UUnet. It still is. Rather than its boxes, using IOS to tie a branch to the data center may be Cisco's greatest contribution to IT operation.

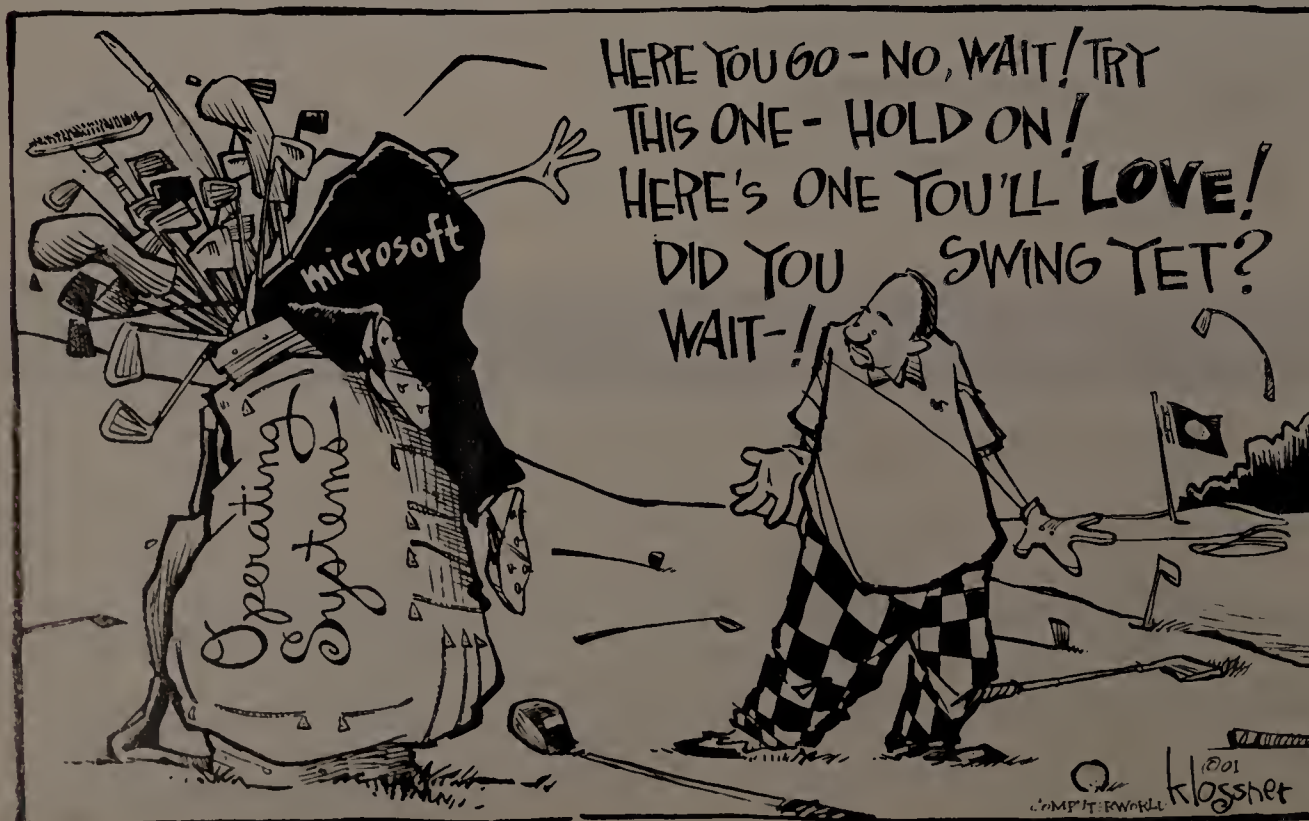
But those 13 million lines of IOS code were aging, and companies like Juniper Networks and Foundry began nipping at Cisco's heels, winning big customers such as MCI, UUnet and Qwest with focused Internet products.

We've seen large established networking companies succumb to market shifts. StrataCom was acquired by Cisco in 1996. Bay Networks was acquired by Nortel in 1998. Wellfleet, Ascend and Cascade were once mighty giants. 3Com was once competition for Cisco, as was Cabletron. Today, they're footnotes.

But Cisco could be supplanted as well. Its near-



PIMM FOX is Computerworld's West Coast bureau chief. Contact him at pimm_fox@computerworld.com.



monopoly on the router market — around 85% — seemed invincible. No longer. It's facing a technology challenge from Juniper's JUNOS operating system and in Gigabit Ethernet from Foundry.

Another issue is Cisco's stock, which has fallen more than 60% from its high last March. Cisco uses stock to do deals (as part of its R&D efforts).

This past May, Cisco's chief strategy officer, Mike Volpi, said Cisco might make more than 30 acquisitions this year. Perhaps, but a lower stock price means deals will be more expensive.

Finally, a report in *PR Week* said Cisco had been sounding out Washington-based public relations firms to handle crisis work. The question is, Is this for the crisis that has passed, or one yet to come? ▀

JOHN GANTZ

Take a Bite Out of Crime on the Web

LAST YEAR WAS A watershed for the Internet. The number of users worldwide passed the 300 million mark. Whew! But that also means that the number of crooks on the Web surpassed 1 million.

The calculation is based on the U.S. Uniform Crime Reporting Statistics, which we have extrapolated to the world at large, so we're only talking about crooks whose vitae include arrest and conviction. Their crimes include forgery, embezzlement, fraud, vandalism and disposing of stolen goods. To reach that number of crooks, we assume that the ratio of criminals to law-abiding citizens is the same in the online world as in the off-line world. At this rate, there will be twice as many crooks on the Web in four years.

Appropriately, spending on hardware, software and services to make Web sites secure will also more than double, from \$14 billion last year to \$30 billion in 2004, according to IDC forecasters.

So everything should be all right, right?

Nope. Metcalfe's Law says a network's value grows by the square of the cost of adding users. So does the potential impact of an action with malicious

intent. Crooks in the off-line world at most can mug only a small group of victims at a time; on the Net, it's as easy as spam pie. With Internet commerce expected to grow from \$300 billion last year to almost 10 times that in 2004, I don't think we're spending anywhere near enough on security.

In an IDC survey last fall, 95% of IT managers at large and medium-size U.S. companies acknowledged that they had experienced some kind of "incident" in the past year, but mostly, that meant dealing with viruses like the Love Bug. Some 55% thought they had had an attempt at unauthorized

use of their systems, applications or e-mail, but only 10% said such an event was detected *after* it occurred. Only 45% thought they had experienced unauthorized access to systems or information. And less than 30% encrypt any e-mail.

Given the highly publicized Web site problems at Yahoo, Microsoft, AOL and the World Economic Forum, I'm surprised that was the only mayhem detected in the survey. I allude to those crime statistics. How many crimes are committed for which there are no arrests and convictions? How many aren't reported or detected?

Make the following assumptions:

- Sometime in the next year, you will have a significant security breach.
- Sometime in the next five years, you or a company in your industry will have a near-catastrophic security breach.
- Between now and then, you will spend only

about a tenth of what you should on security.

■ No matter how many times you have requested more money for security and been turned down, the IT department will be held responsible if and when there's a major security breach.

Two pieces of advice: First, make sure you have some crackerjack security technicians in your shop to stop problems before they occur. And make sure they're well paid, well motivated and won't cause trouble themselves. Half of all security breaches occur from inside the company.

Second, force your company to develop a mission statement on security, document company security policies and spell out security deployment plans for every major business initiative. These should be signed off on by all top executives. That way, when the big breach occurs and you're under fire, you'll be able to drag others with you into the foxhole. ▀

READERS' LETTERS

Burden of Proof

IALSO AM a member of the bar and of some of the same committees that Emily Frye serves on, but I have a very different outlook on e-mail ["Destroy E-Mail, and Find Trouble," *News Opinion*, Feb. 5].

Try to prove that an e-mail was intentionally sent by a particular user. You can't. The time/content data in the e-mail is essentially unproven, and the content of the e-mail may be digitally signed, but the other components of the process leave the validity open to question.

The real issue is the need for a uniform evidentiary model. Without it, and its acceptance by the courts of the world, the e-mail problem will remain.
Todd S. Glassey
Chief technical officer
Boarderless Technologies Inc.
Menlo Park, Calif.

TRYING TO preserve every e-mail carries its own punishment: It costs a lot of money and is an undue burden on the business. When I consider which e-mails to preserve, I look only at the requirements for paper documents. If I wouldn't have to keep the printed

message, the electronic version is deleted immediately. If it really has to be kept, I tend to keep a printed version. That way, all the necessary documents can be presented in the same, consistent format.

Julius Szelagiewicz
Vice president of IS
Turtle & Hughes Inc.
Linden, N.J.

A Kernel of Truth

IUNDERSTAND you needed both sides of the story in reporting on the National Security Administration's Linux release ["Feds Unveil 'Security-Enhanced' Linux Prototype," *Computerworld.com*, Jan. 10], but you really could do better than "an analyst at Aberdeen Group." Kernel developers are much more representative of the Linux community, and Kernel Traffic summaries are just a click away, at http://kt.linuxcare.com/kernel-traffic/kt20010108_101.epl#2.

Grzegorz Staniak
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Not Black and White

INSTEAD OF looking at decentralization as a problem to be solved by centralization, or vice

versa, perhaps one should look at both approaches together ["A New Old Debate" *Business Opinion*, Jan. 29]. Define the strengths and weaknesses of each, then manage the situation to apply the best mix. As the company changes, the mix that's best will change also. Results are what count, and results should ultimately govern the appropriate mix. This is not a black and white issue; why continue to treat it that way?

Eric Goldfarb
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The Plodding Beast

IBELIEVE Don Tapscott is largely wrong ["Bush Can Use IT to Aid Democracy," *News Opinion*, Jan. 22]. Yes, democracy is a plodding beast, but it must be to balance the huge spectrum of interests, constituencies and requirements that exist in any country, especially one as large as ours. Instant polling doesn't make for a good decision. And providing ongoing guidance based on continuous computerized feedback is a recipe for disaster. What real-time guidance would the elected officials who wanted to

keep the Union together have received during the course of the Civil War? Surely, it served the country's interest to have elected the best people and then let them get on with running the country without worrying about collective wisdom and insight from the populace.

Sarwar A. Kashmeri
CEO and publisher
ebizChronicle.com
New York
sarwar.kashmeri@ebizchronicle.com

IMAGINE being governed not by those whom you elected, but by those who have an ax to grind on a particular issue or who have nothing better to do than futz with the issues of the day. And imagine the additional power the various news media would gain with their ability to shape public opinion on an issue.

Jeff Smith
Ringwood, Ill.

COMPUTERWORLD welcomes comments from its readers. Letters will be edited for brevity and clarity. They should be addressed to Jamie Eckle, letters editor, *Computerworld*, PO Box 9171, 500 Old Connecticut Path, Framingham, Mass. 01701. Fax: (508) 879-4843. Internet: letters@computerworld.com. Include an address and phone number for immediate verification.



JOHN GANTZ is a senior vice president at IDC in Framingham, Mass. Contact him at jgant@idc.com.

Windows 95

A fatal exception 0E has occurred at 0028:C0011E36 in UXD UMM
00010E36. The current application will be terminated.

- * Press any key to terminate the current application.
- * Press CTRL+ALT+DEL again to restart your computer. You will lose any unsaved information in all applications.

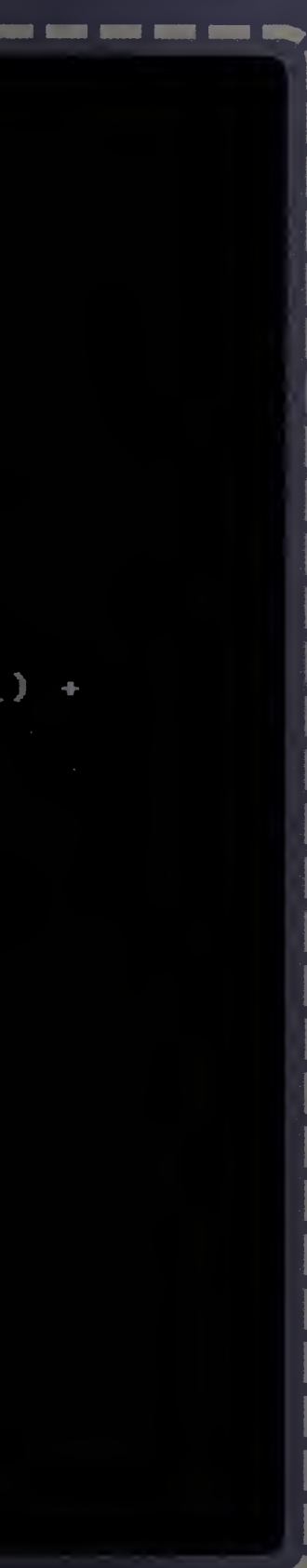
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DON TAPSCOTT

Don't Doubt the Future of the New Economy

THE IMMINENT first-year anniversary of the Nasdaq's implosion is precipitating goofy theories as to what went wrong. Some claim that there isn't a New Economy. E-business and the Internet are a bust, and it's time to go back to tried-and-true principles that have guided commerce and investing for decades, if not centuries, they say.

But heeding such advice would be a stunning mistake. There is a New Economy, with the Internet at its heart. Spurn this notion, and your company's failure is assured.

Whether or not we're in a New Economy isn't some academic discussion. An economy is how goods and services are created, distributed and consumed. Throughout the 20th century, most of this activity

was based on the corporation — vertically integrated as devised by Henry Ford. It was based on an infrastructure that included the electric power grid, roads, railroad tracks and the telephone.

Now there's a new infrastructure added to them — the Internet — that's lowering the costs of transactions and collaboration among people, firms, organizations and other entities.

A new platform of wealth-creation is developing, supplanting the individual corporation as the starting point for strategic thinking. I call it the business web. It's a system of meshed entities — suppliers, distributors, service and infrastructure providers and customers — that use the Internet as the basis for business communications and transactions.

Industry by industry, business webs are eclipsing the old model of the corporation. Smart companies are using the Web to achieve goals they have striven toward for the past 25 years: focusing on core competencies, reducing transaction costs, innovating more effectively and gaining new ways to deepen customer relationships. This is giving rise to new business models that are more effective than those of Industrial Age corporations. This is why the march toward the New Economy continues even though the Nasdaq has crumbled.

Despite what some pundits claim, Nasdaq and the New Economy aren't interchangeable terms. In fact, many Nasdaq companies are Old Economy, and many companies on the (old Industrial Age) New York Stock Exchange are New Economy. A company chooses the economy it wishes to be a part of. It doesn't depend on what product it sells

or on what exchange it's listed. It depends on the business model it embraces to create customer value and shareholder wealth.

Examples abound. Take FedEx Corp. It's listed on the NYSE. It delivers parcels from points A to B, a service that predates Marco Polo. Nevertheless, FedEx is a New Economy company, having redesigned its business processes based on the Web. More than 80% of its shipments are ordered, tracked and managed via the Internet. The company is using the Internet to deeply integrate its logistics expertise into the business processes of other firms. Companies such as Enron, Schwab, Herman Miller, Cisco, Nortel, Gartner and Dell are using business web architecture to outpace their competition.

The lesson of the Nasdaq's tumble is that the Net isn't about dot-coms. But this shouldn't be misconstrued to mean that we aren't beginning a profound transformation in the way societies create wealth. We've only just begun. ▀

WILLIAM M. ULRICH

Collaboration Counts in C-Commerce

DURING THE past two years, collaborative commerce, or "c-commerce," has become a major focus for many organizations. C-commerce optimizes supply and distribution channels to make an organization more competitive and more profitable. Deploying c-commerce systems and related infrastructures helps companies collaborate up and down the supply chain. Collaboration for the common good must be the prime motivating factor in getting demonstrable value from a c-commerce initiative.

For example, Exostar is an electronic marketplace formed by the aerospace industry to optimize the time it takes to move parts and products. Member companies, which include Raytheon, Lockheed Martin and Boeing, also generate improved customer satisfaction because they can use Exostar to trace product availability through the supply chain. A company acting alone could never accomplish this feat.

C-commerce is the next evolutionary step beyond the simple process of selling goods or services to customers over the Internet. It has emerged as a priority because the Internet has made high-speed, widespread buying and selling possible — and necessary.

For example, if companies within your industry

establish an electronic marketplace to attract buyers and you don't participate, your market share could shrink. Similar risks arise when companies refuse to collaborate in distribution, software development or standards initiatives. With c-commerce becoming a necessity, executives should emphasize ways in which people and institutions can cooperate to reach common goals. A multipronged strategy should consider the following:

- Positioning technology as an enabling capability and not the solution.
- Emphasizing collaboration in every aspect of your e-commerce efforts.
- Formalizing governance structures that build collaborative behavior into the bylaws of jointly created c-commerce organizations.

There is significant hype about the claims of software and integration vendors on c-commerce support. Vendor products facilitate everything from online meeting capabilities to interenterprise workflow management. These tools are important enabling factors in a c-commerce plan, but initiating and deploying a c-commerce effort depends more on the collaborative skills of people.

Companies need to cooperate to build common solutions to shared challenges. This may involve shifting to a more collaborative mind-set when working with business partners, suppliers, distributors, customers and competitors. In doing so, executives and employees must cast aside an "us vs. them" mentality and focus on how they can work with other companies to better serve a common set of requirements.

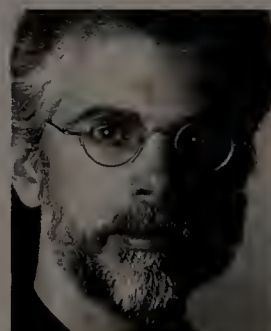
As relationships form, their collaborative nature should be built into the governance structures used to formalize those relationships. Exostar is an independently incorporated enterprise formed to govern c-commerce activities among its members. Its stated mission is "to create an improved way of doing business through an Internet-enabled, secure marketplace that increases the efficiency of transactions and enhances collaboration across the supply chain and product life cycle." The creation of a legal entity to govern c-commerce efforts allowed members to build collaboration into Exostar's bylaws.

Numerous industries have launched other efforts to deploy shared software, sourcing services and e-commerce standards. For example, several companies, including IBM, formed Universal Description, Discovery and Integration (UDDI) to create a directory of services and to help accelerate the acceptance of B2B e-commerce. UDDI hasn't formed a legal entity to institutionalize collaborative behavior, and with no governing structure in place, relationships among members could become less cohesive and destabilize.

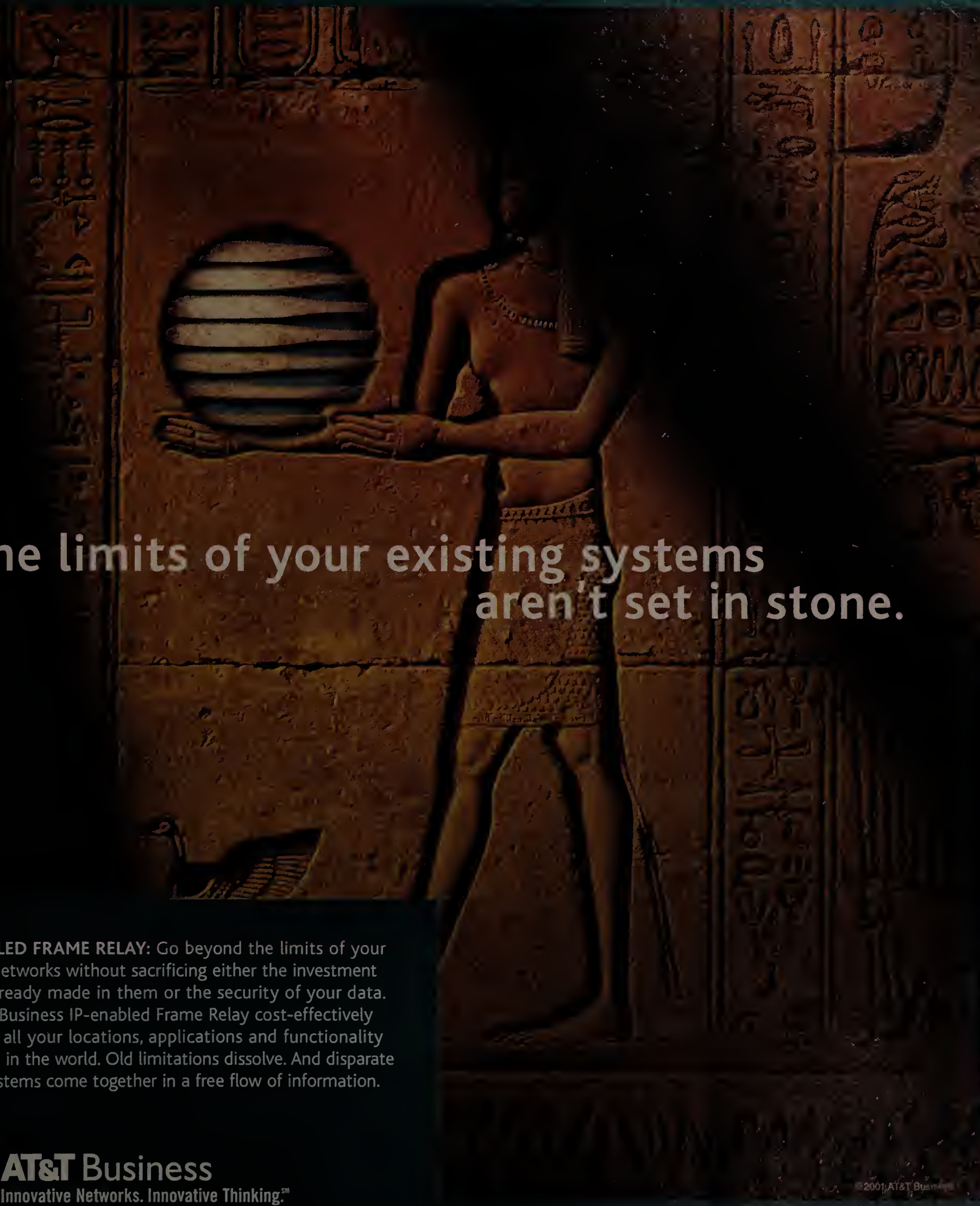
For c-commerce to truly succeed on a grand scale, companies may need to rethink how they view their business partners, customers and competitors. Past reluctance to collaborate with competitors could stymie c-commerce efforts. In this new landscape, everyone is your partner. Formalizing these relationships takes time and commitment, but they will benefit entire industries beyond what any one company could accomplish. ▀



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BUSINESS

HUNG JURY

Canadian supermarket giant Sobeys last month scrapped its \$89.1 million SAP implementation. Some say Sobeys' move is indicative of a larger problem: ERP systems are too complex for high-transaction-volume retail businesses. But others say it just takes patience and skill to make the systems work. **► 36**

MEASURING UP

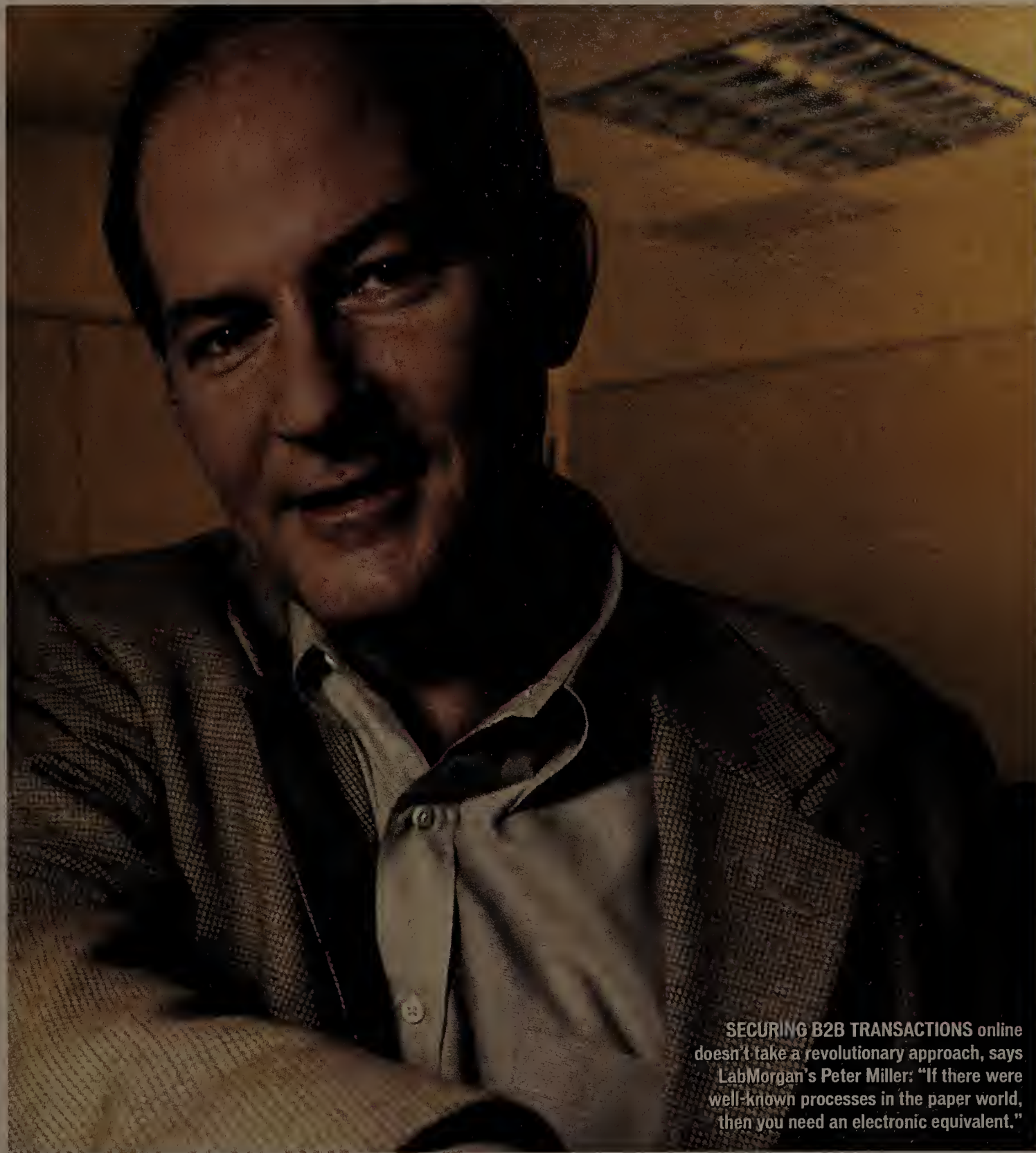
Since the e-commerce world is just hitting its awkward preteen years, there isn't much historical data available to create solid benchmarks. But some consultants are starting to help companies see if their dot-com ventures measure up. **► 42**

MONIKER MADNESS

You've heard of Silicon Valley, but what about Biotech Beach or the Silicon Sandbar or — get this — Automation Alley? Cities, regions and states around the country have taken on high-tech sobriquets to help them vie for top IT talent. But how many of these digital destinations live up to their names? **► 44**

TAXING MATTERS

For many independent consultants, sitting down with a copy of Form 1040 Schedule C is a horrifying thought. But tax time doesn't have to be overly painful, say those who have learned that lesson the hard way. **► 46**



SECURING B2B TRANSACTIONS online doesn't take a revolutionary approach, says LabMorgan's Peter Miller: "If there were well-known processes in the paper world, then you need an electronic equivalent."

GARY GLADSTONE

FINDING WAYS TO FIGHT FRAUD

YOU THINK YOU'VE COVERED ALL THE BASES in crafting a B2B e-commerce strategy — until you realize that you haven't taken any steps to protect yourself against fraud from your business partners. IT managers like Peter Miller (above) of J.P. Morgan Chase subsidiary LabMorgan are discovering technologies that can help companies guard their fortresses.

40

Retailers Hit Installation Bumps With SAP Software

ERP giant gets mixed reviews on its retail line

BY LUCAS MEARIAN
AND MARC L. SONGINI

SAP AG's applications for retailers continue to be stung by a series of high-profile installation problems that many say illustrate the complexity of trying to fit an integrated suite of enterprise resource planning software into a retail operation.

The latest example came late last month, when Canadian supermarket chain Sobeys Inc. abandoned an \$89.1 million SAP Retail implementation.

"[SAP Retail has] insufficient core functionality... to effectively deal with the extremely high number of transactions in our retail operating environment," said Bill McEwan, president and CEO of the Stellarton, Nova Scotia-based retail chain.

Sobeys isn't alone.

Jo-Ann Stores Inc. in Hudson, Ohio, and pet supply retailer Petsmart Inc. in Phoenix last fall both attributed low financial results to problems with their SAP Retail rollouts. Both, however, said they're pleased with the system overall.

SAP officials continued to defend the capabilities of SAP Retail. Geraldine McBride, general manager of the consumer sector business unit at SAP America Inc.,

said the German vendor has signed up 264 retailers as customers, 128 of which have gone live.

But Greg Girard, an analyst at AMR Research Inc. in Boston, said most of the retailers are running SAP's financial and human resources applications, not SAP Retail itself.

"I can't point to a single happy SAP Retail account in North America," said Girard.

SAP Retail is a good product, argued Kevin Restivo, a Canada-based analyst who works for IDC in Framingham, Mass. But technology is never a "silver bullet, [just] part of a larger puzzle" that includes making sure internal business processes are in tune with the software's capabilities, Restivo said. That's especially true given the processing complexities faced by retailers, he added.

In late 1998, Reebok International Ltd. was the first U.S. company to go live with SAP Retail, which now supports 115 outlet stores run by the Stoughton, Mass.-based footwear maker. Peter Burrows, Reebok's chief technology officer, said the SAP system is producing "a very high level of stock accuracy" in the stores.

But the yearlong installation process wasn't easy and required some adjustments as the project went along, Burrows said.

The Home Depot Inc. recently completed an SAP R/3 installation in

the company's Argentina operations.

Gary Cochran, vice president of information services at the Atlanta-based home improvement retailer, said he made "limited use" of SAP's consulting services.

Instead, Cochran put together a team of 50 top employees — IT personnel and end users. Because of the team's familiarity with legacy systems, he said, it didn't have to "face some of the configuration issues that have been problematic for other people."

"It went so smoothly, there was literally no ripple in corporate organization," Cochran said. ▀

ERIC J. SINROD/E-LEGAL

Demanding Privacy

THE TIME HAS COME for Congress to step up to the plate and enact legislation that provides baseline Internet privacy protection.

Contrary to popular belief, the U.S. Constitution doesn't generally guarantee personal privacy.

Rather than fill in the gap, however, Congress and the Clinton administration espoused "self-regulation" as a solution to privacy concerns. Unfortunately, some privacy certification programs were criticized for failing to adequately enforce privacy compliance. Meanwhile, for several years in a row, FTC surveys have shown poor Internet privacy protection by many Web sites.

Because of such concerns, Congress has taken some legislative steps, including the Children's Online Privacy Protection Act, which became operative last April. It has also provided privacy protections for certain sectors through legislation such as the Financial Services Modernization Act.

Lacking definitive federal law, some states have passed their own measures. But much of this legislation is unenforced or incomplete.

An analysis this year of 751 U.S. and international Web sites conducted by Consumers International

— a London-based consortium of consumer-protection organizations — found that "most sites collect personal information but fail to tell consumers how that data will be used, how security is maintained and what rights consumers have over their own information."

The good news is that Congress is catching on.

Various Internet privacy bills have already been introduced in the

107th Congress, and there will likely be many more.

Congress should pass legislation that, at a minimum, forces Web sites to display privacy policies prominently, lets consumers know how companies collect data and lets them access their own data and opt out of having their data collected altogether.

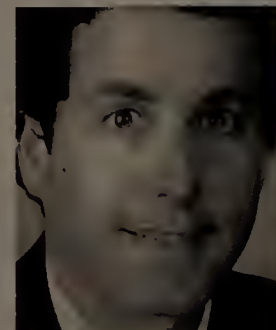
Some privacy advocates have suggested that legislation should go even further, barring cookies and Web bugs and requiring consumers to opt in before a Web site can collect personal information.

But should federal privacy regulations preempt state laws? With no realistic geographic boundaries, it's difficult for online businesses to comply with potentially competing laws of different jurisdictions. The National Association of Attorneys General is urging Congress not to hamper state enforcement of privacy violations. And the U.S. Chambers of Commerce has vowed to

fight further regulation.

Issues like federal preemption shouldn't slow down the privacy legislative train. Every day, we learn about greater potential for Internet privacy invasion. Just two weeks ago, it was revealed that Nortel's Personal Internet technology suite can enable ISPs to track the online movements of customers.

Enough already. Let's get some baseline privacy protections in place now. ▀



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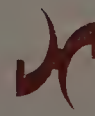
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E-GM President: No Slump

General Motors Corp. announced earlier this month that its January sales were down 5% from January 2000.

The news followed recent announcements by Detroit-based GM that it will seek to reduce its head count by 10% and low-

er its inventory levels.

But Mark Hogan, president of e-GM, said he is optimistic that an economic downturn won't affect IT initiatives currently under way in his unit, which is charged with managing the

automaker's consumer Web entities.

Hogan recently spoke with *Computerworld's* Lee Cope-land Gladwin about the company's current situation and its plans for the future.

Q: How will GM's IT initiatives be affected by the slump that the automotive sector is facing?

A: There is no slump. ... We went through a fourth-quarter production adjustment because our inventory was built a little higher than we would have liked. But the combination of federal interest rate cuts along with the prospective tax cut has given us some early indicators that consumer confidence is coming back up.

Q: Are IT cost-cutting initiatives more or less important in the face of a possible economic recession?

A: It's not a recession; it's a strong market. There is belt-tightening going on. Most companies, in very good times, tend to let up a little bit on due diligence over cost creep and structural costs. And General Motors is not any different. We've had more structural costs creep into the business than we would like, and that's why we announced a 10% salary head-count reduction, which we will handle by attrition.

Q: Will IT be affected by this head-count reduction?

A: IT has not been affected. In fact, it's fully funded ... because we need them.

Q: How important is Covisint (the online auto exchange formed a year ago by GM, Ford Motor Co. and DaimlerChrysler AG) to GM, and will funding for it continue even if the economy faces more downturns?

A: The Covisint exchange is very important to us because it is the engine to drive what we call order-to-delivery. And that's what we're trying to move to — where the customer orders either online or in the dealership and has a highly predictive date of when they'll receive that vehicle. It'll be much quicker than our current model, which is 60 to 90 days.

Q: Is GM's ultimate goal build-to-order, in which the vehicle gets built after a customer orders it?

A: Build-to-order is coming. We have to enable our back-end systems ... line up our supply-chain pipeline and be more efficient. ▀



HOGAN: "There is no slump."

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WORKSTYLES

Lawrence Berkeley Lab Uses IT To Explore the Wonders of Science

Interviewee: Brent Draney, network analyst

Company: National Energy Research Scientific Computing Center (NERSC), a division of the Ernest Orlando Lawrence Berkeley National Laboratory

Main location: Berkeley, Calif.

Number of IT employees: 200

Number of employees (end users): 4,000 at Lawrence Berkeley; NERSC

supports about 2,500 scientists and researchers worldwide who use the network to access the lab's supercomputer.

What's the mission of Lawrence Berkeley?

"We're a Department of Energy (DOE) facility supporting government and academic research in a range of fields, from chemistry to

energy, the environment, biology, physics, etc. Because there's such a huge and diverse set of research happening throughout the DOE and the world, DOE created a supercomputer center so that scientists would have the resources to do the computations they need to support their research."

How is supporting a research network different from supporting a corporate network? "We're the largest unclassified computer center in the world. Where most companies measure things in gigabytes, we measure them in terabytes, and we're currently working toward a petabyte of online storage – that's 1,000 terabytes. So I'm constantly dealing with our ability to have the best possible throughput.

"Also, in a corporation, the most important goal is 24/7 up-time, because outages could mean lost revenue. Our funding model isn't based on profit; the most important thing is providing the best resources possible. So availability is important, but we can go down for short times to push the capabilities of the computers and the network."

What impact has the California energy crisis had on NERSC? "We work in the dark a lot because we are very energy-focused. But fortunately,

we're not subject to the rolling blackouts because, by random luck, we're in an area with police and fire stations, [which are exempt from the blackouts]."

Are you a government employee? "The lab is funded by the DOE, but the University of California currently has the contract to run the lab. So technically, we're employees of the university system."

Do you have to worry about job security when there's a change in administration in Washington? "We're actually a line item in the congressional budget, so we feel somewhat secure, mainly because of the research we turn out."

Compensation and bonuses:

"They do their best to adjust salaries to market level, but any government or academic institution is going to lag behind. We don't have bonuses or stock options, but we get spot awards and outstanding performance awards."

Training: "We have a lot of training, and because we're dealing with advanced and specialized equipment, training requirements are written into our reviews. Also, they'll pay up to a third of our salary toward pursuing an advanced degree."

Workday: Flexible. "We rotate being on call 24/7. Some weeks it's very quiet, and others are like last night – I got paged three times."

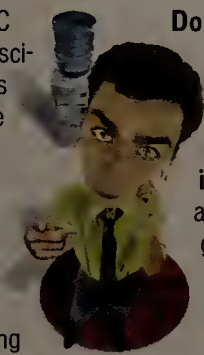
Kind of offices: A combination of open space and private offices.

Any windows? "Yes, with some of the best views of the San Francisco skyline and bay in the world."

Little perks: Team-building outings, a holiday party and division meetings "where scientists present to us the research that we've made possible, and it's amazing to see the fruits of your efforts."

Last companywide/department perk: "A team-building event sailing on San Francisco Bay on my sailboat."

– Leslie Goff
(lgoff@ix.netcom.com)



What It's Like To Work at ...

Spelling Success

ED YOURDON

I LEARNED AN IMPORTANT LESSON in my IT career years ago, when I accompanied a veteran colleague to a project kick-off meeting. Someone else was in charge, but my colleague took advantage of a brief moment of silence at the beginning of the meeting.

"I thought it would be useful," my colleague said innocently, "if we could agree — before we get into all of the technical details — as to how we would recognize whether the project has succeeded."

Several people in the room cleared their throats in preparation for long soliloquies on the True Meaning of Success. But before anyone could start, my colleague charged ahead with another observation.

"Actually," he said, with the same air of innocence, "I think it would be useful to begin by asking *who* is allowed to declare success."

Another moment of startled silence, and everyone turned expectantly to the manager who had convened the meeting and who was presumed to be in charge of everything.

To his credit, this manager responded by saying, "I'd like to say that I'm the one who declares success or failure, but the truth is that if Fitzgibbons [not his real name] in finance doesn't like what we're doing, he can pull the plug on this project anytime he wants."

This was apparently news to several people sitting around the table, for the shock was evident on their faces.

"Well, what about Mr. Harrison?" my colleague asked, referring to the CEO with the respect and deference that indicated that Harrison (not his real name) was just as powerful as his title implied.

"Oh, well, Harrison can kill the project too," the first manager replied with a shrug. "But this project is a real hot potato, and half of the board isn't sure it's a good idea. Harrison doesn't have the power to defend this project single-handedly, nor can he unilaterally declare it to be a success."

After a little more discussion, it became evident that we had all signed up for a project whose success couldn't be guaranteed by any one executive, but whose failure could be decreed at a moment's notice by a half-dozen stakeholders.

And that led us back to my colleague's first question: What would be the criteria used by these people to decree success or failure?

It didn't take long to arrive at another set of political realities: None of the power-wielding executives cared at all about maintainability, portability, reliability, flexibility, user-friendliness or any of the other aspects of "quality" that the IT professionals cared about so passionately. None of them cared whether the technical work was worthy of the ISO 9000 and SEI CMM certifications that the IT department had worked so hard to achieve.

The system's functionality was important, but there was a consensus among the meeting's attendees that the key stakeholders were pragmatists in this area: If we remembered the Pareto Principle and delivered the key 20% of functionality that provided 80% of the system's benefits, we would be safe.

As for budget, our official-but-powerless manager explained, "If we go more than 20% above our budget, Fitzgibbons will pull the plug. Otherwise, it doesn't matter."

And on the all-important issue of schedule, we learned another reality: "No one believes we're going to come anywhere close to the official schedule; they keep talking about it just to maintain the pressure on us. But if we don't get this system finished by the time we go out for our next round of [venture capital] funding, then we're toast. Harrison will cancel the project, and he'll personally fire every one of us."

To manage a successful project, there's a lot of detailed, day-to-day work that must be done.

But you would be amazed how many intelligent, experienced managers never ask these two fundamental questions at the beginning of their projects: Who has the right to declare success? And what are the criteria that will be used to determine success or failure? ▀

Yourdon is the editor of Cutter IT Journal, published by Cutter Consortium in Arlington, Mass. Contact him at www.yourdon.com.

What are the criteria that will be used to declare success or failure?



FRAUD BUSTERS

New technologies capable of handling secure, real-time transactions will help prevent, detect and prosecute B2B e-commerce fraud. By Mathew Schwartz

PICTURE THIS: You're the CEO of a high-tech electronics manufacturer and keep most suppliers on a short leash with one-year contracts. But in order to reduce headaches, increase automation and share the risk of price fluctuations for one trusted supplier, you've agreed to a standard "cost-plus" pricing model — you partner with the supplier, and it opens its books and charges you a fixed margin above an item's "at-cost" price. Now, your networks talk with each another for procurement and billing, and inventory is automatically ordered and delivered. Your company saves time and money by not having to oversee everything.

Right?

Right on all counts but one. Yesterday, one of your engineers noticed that the price of a key component in a circuit assembly was half what it used to be, but the price reduction hadn't been passed on; the supplier has been overcharging you. Think it could never happen? Well, it did recently to a West Coast electronics company, which demanded — and received — the money it was due, with interest, from the supplier. Rather than issuing a verdict as to whether it was intentional fraud or a mistake, the electronics maker levied a stiff penalty against its supplier to make sure it would never happen again.

Welcome to the intricacies of business-to-business e-commerce, where having a successful business isn't about having the best technology or

portal design. Even when networks talk to each other, securely and in real time, such commerce is fundamentally about finances: Is the price right? Do customers really have the money they need to buy the goods they've ordered? Are sellers absolutely guaranteed to receive their money?

How Bad Is It?

The extent of business-to-business e-commerce fraud today isn't fully known because many companies don't report their losses. But with Stamford, Conn.-based Gartner Group Inc. forecasting that the worldwide business-to-business exchange market will grow to \$7.29 trillion by 2004, even minor incidents of fraud could be worth millions of dollars.

The average organization loses about 6% of its total annual revenue to fraud from customers and business partners, and from abuses committed by its own employees, according to the Association of Certified Fraud Examiners in Austin, Texas. The association pegs the total fraud and abuse price tag for U.S. organizations at \$400 billion annually.

Given the risk of fraud, it's not surprising that many companies haven't even begun conducting business-to-business e-commerce. "Most of the companies I'm working with now are not seriously engaged in Internet-enabled B2B e-commerce. They're still evaluating the risks," says Vish Krishnan, a professor at the McCombs School of Business at the University of Texas at Austin who primarily deals with companies in the communica-

tions, electronics and automotive industries. Those risks include being able to hold business partners to bank-approved spending limits and securely authenticate buyers.

But securing business-to-business transactions online doesn't take a revolutionary approach. "If there were well-known processes in the paper world, then you need an electronic equivalent, a parallel solution set," says Peter Miller, managing director and head of technology commercialization at LabMorgan and, until last year, the CIO at its parent, J.P. Morgan Chase & Co. in New York. LabMorgan commercializes existing and new electronic finance assets of J.P. Morgan.

To put it simply, business-to-business e-commerce requires that companies be able to apply all of their business rules to a given transaction. For instance, they need secure messaging, user authentication and spending limits. And electronic data interchange (EDI) can't do it alone.

The Limits of EDI

For years, EDI has been a mainstay of the banking and automotive industries, as well as many others. But the limits of EDI — one message at a time, the need for virtual private networks, the large initial costs that prevent many smaller companies from using it — work against real-time Internet-based fulfillment.

"There are a series of value-added e-business services that need to be made available on the Web that, in conjunction with each other, allow real-time buying and selling to take

Preventing B2B E-Commerce Fraud

1. Understand your corporate crown jewels (critical assets).
2. Understand who wants what you have (threat agents).
3. Keep abreast of common attacks and electronic-fraud schemes that could be used against your network.
4. Ensure strong authentication (i.e., PKI).
5. Develop procedures for forensics (evidence collection) and incident response, such as an emergency response team or investigators.
6. Train staff in incident response and forensics.
7. Develop electronic-records retention policies for logs and maintain them for an adequate period of time.
8. Maintain adequate transaction logs, network logs and Internet service provider logs.
9. Use monitoring tools to identify transaction irregularities, network intrusions, and Internet, e-mail and vulnerability alerts.
10. Perform penetration testing (attacking your own network to judge its security) with forensics testing tools.

place," Miller explains.

That's why more companies are investigating transaction delivery networks (TDN) that use the Internet, guarantee that transactions are received and ensure that buyers can't repudiate any of their orders. TDNs use public-key infrastructure (PKI) and the Lightweight Directory Access Protocol components to not only identify buyer and seller but also to encrypt the transaction. With TDNs, "the ability to commit fraud in those B2B transactions would be very significantly reduced," Miller says.

J.P. Morgan built such a system for internal use in 1995. Miller says it delivered \$800 billion per day in financial transactions across 10 J.P. Morgan businesses, and it delivered a billion messages without ever losing one. The bank spun the network off as a product last year and created a company to offer it called TransactPlus Inc. in Emeryville, Calif. Early customers include J.P. Morgan, Arcordia Solutions Ltd. in London (another J.P. Morgan spin-off) and SI Corp. in Atlanta. Miller oversaw the development of TransactPlus while he was CIO at J.P. Morgan.

Because it's a TDN, TransactPlus is an outsourced network for guaranteeing the secure delivery of transactional messages — something the plain-old Internet can't do. So if a TDN were processing a funds transfer, it would make sure that money was taken out of one account and deposited into another, or else it would halt the transaction. That's a crucial step for improving business-to-business accountability while reducing the potential for fraud.

Whereas EDI took decades to gain acceptance, Gartner Group predicts rapid TDN adoption, because initial costs are minimal and the need already exists for many companies.

TDNs are good for delivering and confirming the receipt of messages, but then there's the problem of confirming that the faceless potential buyer of \$500 million worth of steel is really who he says he is. That's where PKI comes in. PKI uses a set of public and private certificates to make sure encrypted messages arrive unaltered. A user "signs" a digital certificate with a secret password. Compared with the paper-based method of obtaining actual signatures, PKI is much more secure and also leaves a digital audit trail, thus greatly reducing the risk of fraud.

But digital certificates are only as good as the certificate authority that maintains them. Because of concerns about quality control and the potential difficulty of interfacing with multiple certificate authorities to complete any one transaction, the banking industry created its own. In April 1999, the world's 13 largest banks, including Deutsche Bank AG and Citigroup Inc., formed Identrus LLC in New York.

Identrus' charter is to help banks become the de facto underwriters of e-commerce transactions so that bank identities can be validated in real time at three different levels, the highest being a bank guarantee that any given transaction will take place. In addition, big banks are charged with signing up smaller ones.

The goal of New York-based Identrus is to eliminate fraud. "What we're trying to do on the front end is to offer real-time commitment on the signing of the order," says Arthur Brieske, manager of e-commerce product management, Europe, at Deutsche Bank in Frankfurt. That way, a seller can know in real time that he has received an order that the buyer can't repudiate.

Managing Risks

Though TDNs and PKI are technologies companies can use to prevent business-to-business fraud, bad things invariably happen. For instance, "between business partners, there's a lot of theft of intellectual property," amounting to millions of dollars each year, says Jay Ehrenreich, a senior manager in global risk management solutions at New York-based PricewaterhouseCoopers.

The good news about investigating business-to-business e-commerce crimes is that "with digital certificates and signatures, it's easier for you to trace back and get that evidence, and if the evidence isn't there, it's easier for you to point your finger at who was negligent," says Brieske.

Still, companies need to be careful with any evidence they collect. "Very few companies actually follow correct guidelines in terms of handling electronic evidence," says Ehrenreich. For instance, he says, companies need meticulous chain-of-custody procedures. Without them, legal defense teams will have little difficulty destroying the data's credibility.

"Change one bit, you must acquit," says Ehrenreich. ▀

11. Obtain forensic tools and utilities to support investigations.

12. Identify your specific vulnerabilities to network-based attacks and transaction-based schemes.

13. Practice spin control so you can articulate the scope and type of incident and prepare management's response to any cybercrime or fraud.

14. Consider taking out a cyberfraud insurance policy to limit losses.

15. Get to know your customers, partners and outsourcers through screening and due diligence.

SOURCE: JAY EHRENRICH, PRICEWATERHOUSECOOPERS, NEW YORK



PETER MILLER of J.P. Morgan Chase's LabMorgan: Companies need an electronic equivalent — "a parallel solution set" — of processes from the paper-based world to secure B2B transactions.

THE ALL-TOO-VISIBLE FIZZLE of dozens of Internet companies in recent months has many executives demanding detailed status reports on just how their own e-commerce operations compare.

But there's not a lot of data out there to measure against. At least not the kind of deep, historical benchmarking metrics that seasoned IT and corporate managers can gather to judge the performance of other functional areas, such as end-user training or software maintenance.

"There's a long history to compare and contrast yourself against in mainframe-oriented IT benchmarking, and even client/server," says Michael Lee, a systems consultant at AIT Global Inc., an IT education and seminar group in Kings Park, N.Y. "That's not the case with strategic Internet projects."

Senior IT managers typically don't share many stories about what has or hasn't worked for them because e-commerce is viewed as a potentially huge source of sales and profits. No one wants to give away their big-money secrets.

As a result, questions often go unanswered, such as, "How does our plan for tying a warehouse inventory system to an online ordering application stack up against the way others have done it?" or, "Do the three extra months my development staff takes to build new features for our shopping cart software give us any competitive advantage?"

Rather, the metrics most often used to measure the success of Internet projects are of a much smaller scale. For example, log files can be used to catalog who visits a site, when they visit and what they do there — data from which analysts can extrapolate whether a given link or set of pages is effective. The IT department can create survey boxes to solicit opinions from random Web visitors. Software packages can test how quickly pages load and whether links are broken.

Short on Answers

But these measures don't yield much concrete material about how a company's Internet efforts compare with those of its rivals and whether it spends IT money wisely.

A few companies, such as Keynote Systems Inc. in San Mateo, Calif., and Hackett Benchmarking and Research in Hudson, Ohio, have begun to sell consulting services to address these questions.

Hackett, for example, instructs user companies to collect specific data from business units and their IT groups about the performance of and costs associated with key applications. For instance, a recent Hackett study at TRW Inc., an automotive and aerospace products maker in Cleveland, required the company to collect data on such items as spending on hardware, software, networking and staff, as well as details on how supplier contracts are managed.

Hackett then helps the client run the information through proprietary benchmarking software and databases that contain similar data from 1,600 other companies. The final report, available two to three months later, rates the customer's practices against those of its peers.

Though that sounds like a long time, the feedback will likely still be useful, Lee says. That's because it's designed to address larger e-commerce operational issues, such as Web development

E-LUSIVE BENCHMARKS



BELLE MELLOR

Despite a dearth of **historical data** to benchmark against, **consultants** are now beginning to provide services to **compare** your **e-commerce** operations with those of **other companies**.

By Kim S. Nash

processes, rather than small, fast-changing topics, such as whether a new button triggers visitor click-through.

The process typically costs \$25,000 to \$50,000, says Rick Roth, managing director at Hackett, which benchmarks e-commerce projects as well as more traditional IT areas.

The Limited Inc. recently hired Hackett to gauge the overall effectiveness of its IT practices. The key finding, says Rodney Fleming, an advanced technology consultant at the Columbus, Ohio-based clothing retailer, was that The Limited could save money by buying more packaged software and doing less custom in-house programming.

External Comparisons

As for Internet ventures in particular, it's easier to determine the effectiveness of some practices than others, Fleming says.

For example, trying to determine whether end users are making productive use of The Limited's intranet is tricky because it's not clear to management whether employees use it because they find it useful or simply because they're forced to, he says. But for Fleming, there's just one mea-

sure of an external e-commerce site that matters: "Are we profitable? That sums it up," he says. He declines to say, however, whether www.limited.com or the Web sites of The Limited's business units — such as www.victoriassecret.com — make money.

Another Hackett customer, Agilent Technologies Inc., an industrial and health care technology company in Palo Alto, Calif., plans to standardize all of its Web hardware and software as a result of its benchmarking study.

"This is a much more cost-efficient method of rolling out [online] initiatives, and it also increases the speed of our successes by allowing the same experienced team to be involved in all of our Web projects," explains Harry Smith, controller of CIO programs at Agilent in Colorado Springs. He declines to say how much time or money the company would save that way.

Needed: More Details

Still, for e-commerce, benchmarking techniques must change before companies will get an accurate read on their online performance, says Patricia Seybold, CEO of Patricia Seybold Group Inc., a consulting firm in Boston.

Companies with Internet savvy are looking externally, measuring what matters to customers, Seybold says. "Instead of simply worrying about click-through rate, [companies should] actually measure customer satisfaction on a very detailed basis," she suggests.

Important questions are whether the customer would do business with the company again and whether he would recommend the site to friends.

Seybold also advises doing frequent — perhaps quarterly — satisfaction surveys and comparing their results with those of similar polls done by phone and in person. This data should also be compared to call center files that track customer complaints and problems, she says. That will highlight trends and process problems to fix immediately.

E-commerce benchmarking must "get down to where the rubber meets the road," Seybold says. "We need to put ourselves into the customer's shoes now." ▀

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SILICON SILLINESS REVISITED

Silicon this. Digital that. There are places all over the country that would have you believe that they are new hotbeds of high technology and job opportunity. We take a look at the reality behind their myths. By Gary H. Anthes

“WE HAVE JET SERVICE HERE,” brags Chris Young, a senior project manager at the North Dakota Department of Economic Development and Finance. “We have hot water, we have heat, and we have electricity.”

Young isn't joking. He says many people have an otherworldly mind-set about North Dakota. He recalls a recent visit to New York when someone asked him how he had made his way there: “I said, ‘Didn't you see my horse outside?’ ”

Young's job is to attract high-tech employers, not all of whom can name the capital of North Dakota (Bismarck) or even know exactly where it

is (between Minnesota and Montana, and just as cold).

In addition to heat and electricity, Young says, the state boasts a low cost of living and workers who are extraordinarily well educated yet are often employed in jobs well below their abilities. “Underemployment — in huge capital letters — is our problem,” Young says. But the state's problem is a golden opportunity for high-tech employers, he insists.

It will be some time before any North Dakota city joins the ranks of techno-enclaves such as San Jose, Seattle, Boston or Washington. But the state is unmistakably an up-and-comer in high technology. Recently, the Santa Monica, Calif.-based Milken Institute

Silicon Somethings

ARIZONA

Phoenix — **Silicon Desert**

CALIFORNIA

Orange County — **Biotech Beach**

Palm Springs to Thermal — **Cyberchella Valley**

Coast south from Ventura — **Digital Coast**

Santa Monica/Marina Del Ray — **Media Del Ray**

East of Market Street, San Francisco

— **Multimedia Gulch**

Santa Barbara — **Silicon Beach**

Southern part of state — **Silicon Freeway**

San Jose — **Silicon Gulch**

Alameda — **Silicon Island**

Scotts Valley — **Silicon Village**

Petaluma/Santa Rosa/Napa Valley — **Silicon Vineyard**

San Diego — **Telecom Beach**

COLORADO

Colorado Springs — **Silicon Mountain**

CONNECTICUT

Merritt and Wilbur Cross parkways — **Silicon Parkway**



published a list of the top 50 U.S. cities in terms of growth in high-tech output during the 1990s. Grand Forks, N.D., and Bismarck ranked 37th and 43rd out of the 315 cities considered, respectively.

Trying to improve their chances of landing on one of these lists, many metropolitan areas have aped Silicon Valley by adopting names such as Silicon Prairie, Silicon Gulch or Silicon Bayou (see story at right).

About two years ago, in an article titled "Silicon Silliness" (March 22, 1999), *Computerworld* investigated some of these locales to find out which of them truly deserved their titles. Deciding it was time to take another look, we're presenting an updated list of Silicon *Somethings* (see below).

It's not clear how much this moniker mania has helped attract high-tech companies. But a number of small and midsize cities have, almost unnoticed, begun to morph into digital domains.

The Milken Institute's list of 50 top "tech poles" — which combines several measures to arrive at a city's overall "technology gravitational pull" — includes perennial favorites such as San Jose (No. 1), Boston (4) and San Francisco (22). But also making the top 50 are Albuquerque, N.M. (7); Boise, Idaho (24); Cedar Rapids, Iowa (35); Minneapolis-St. Paul (32); and Colorado Springs (42).

These upstart tech poles say three things give them an edge: well-educated, highly motivated workers; modest living costs and tax rates; and lifestyle amenities to die for.

"Having to sit through a stoplight twice here would be considered a massive traffic jam," says Bob Lokken, president and CEO of Knosys Inc., a software developer in Boise. "Our offices are about 100 yards from the river. Guys go fly fishing at lunchtime if they want to." Lokken says one-third of

Knosys' 100 employees came from outside the state, many looking for access to fishing, backpacking and skiing. They came, too, for Boise's laid-back, low-crime community. And few ever leave Boise, it seems, giving Knosys a turnover rate close to zero.

That turnover rate, combined with low taxes and living costs, gives the Boise area's 360 high-tech companies a huge advantage over their counterparts in Silicon Valley, Lokken says. Technology companies with a major presence in Boise include Hewlett-Packard Co. and Micron Technology Inc.

In a recent study of the country's top 60 "cybercities" that was conducted by the AEA (formerly the American Electronics Association), the Washington-based trade group ranked Boise second after Fort Worth, Texas, among small cities for growth in high-tech employment from 1993 to 1998 and found that Boise had the shortest average commute time (16.3 minutes).

Poised for Growth

Colorado Springs ranked first among all cities in high-tech employment growth, second after San Jose in percentage of homes with computers and Internet access and second after Boise in average commute (18 minutes). A number of relatively remote small and midsize cities ranked high in the AEA's various measures of technoprowess.

Semiconductor makers have been in Colorado Springs since the late 1970s. But the area got its biggest boost to high-tech status in 1992 when MCI Corp. moved hundreds of software developers there from northern Virginia.

Now, at a population of 515,000, the area has reached the critical mass that attracts ever more high-tech workers, says Rick Scott, president of the Greater Colorado Springs Economic Development Corp. He says technology workers can move to Colorado

Springs knowing that their spouses can probably find employment there and that if they lose their jobs, they can easily find new ones.

Places like Colorado Springs and Boise can now profit by comparison with areas that are saturated with technology companies and people, says Ross DeVol, director of regional and demographic studies at the Milken Institute.

"In Silicon Valley, Atlanta and Fairfax County, Va., what was a 20-minute drive to work is now an hour and 20 minutes or longer," DeVol says. "And the median house price in Silicon Valley for a three-bedroom house is \$550,000."

Nevertheless, getting IT executives to move to small, out-of-the-way places isn't easy, no matter what the quality-of-life benefits, says Michael Nieset, a principal and managing director at Christian & Timbers, an executive recruiter in Cleveland. It's far easier, he says, to get midlevel managers and programmers and analysts to take jobs in those places.

In fact, Nieset says, companies established in large cities might well open branch offices in more remote locales to take advantage of the low costs, much as some companies today outsource software development to India. The most senior employees might be moved to those places for, say, two-year tours of duty while more junior employees would stay permanently.

Some high-tech workers will always want to be in one of the country's technology epicenters, "but many other young workers are deciding there are other places that offer a better lifestyle," DeVol says. "They have been voting with their feet." In the next five years, the biggest growth in high-tech employment will be in cities like San Diego, Colorado Springs, Salt Lake City, Boise, and Austin, Texas, he says. ▀

What's in a Name?

Are Silicon Prairie, Silicon Glacier and Silicon Bayou among the hottest of the country's high-tech hot spots?

"They are not real," says Michael Nieset, a principal at Christian and Timbers.

So they're just Silicon Valley wannabes?

"I wouldn't even give them that much credit," Nieset sniffs.

Keith Dawson, editor and publisher of the online newsletter "Tasty Bits From the Technology Front" (www.tbtf.com), has made something of a specialty of cataloging these "siliconia." He says there are more than 100 such places now, most of them in the U.S. (See "Silicon Somethings," below.)

There are 10 places going by the name Silicon Prairie, five Silicon Beaches, three Silicon Mountains and two each of Silicon Bayou, Forest, Gulch, Parkway, Swamp, Tundra, Village and Vineyard. There's a Silicon Hollow in Tennessee and a Silicon Holler in Virginia. Just west of Philadelphia lies Philicon Valley, and Fairfield, Iowa, is Silicorn Valley.

"I think a lot of places are doing themselves a disservice by being 'silicon' copycats," says Ross DeVol, director of regional and demographic studies at the Milken Institute. "It raises credibility issues. You're better off saying you are *not* Silicon Valley but you have some of the basic ingredients to actually make something happen there."

Dawson says that in order to become a high-tech mecca, a city or region needs excellent schools, a political consensus for technology promotion at state and local levels, good access to venture capital and "some sort of local booster club or trade association."

And not being Silicon Valley is now a plus, Dawson says. "It's impossible to drive in, undesirable to live in, impossible to buy a house in. It's basically choking," he says.

Perhaps the only high-tech growth area in the U.S. not to have crowned itself with a "silicon" title is Boise, Idaho, which has the ninth-highest percentage of technology workers among all U.S. cities. "The area has not really marketed itself," says Bob Lokken, president and CEO of Knosys in Boise. "It's a well-kept secret." — Gary H. Anthes

FLORIDA

Boca Raton — **Silicon Bayou**
Entire state — **Silicon Beach**
Indiantown — **Silicon Swamp**
Perry — **Silicon Swamp**

ILLINOIS

Chicago — **Silicon City, Silicon Prairie**
Urbana/Champaign — **Silicon Prairie**

IOWA

Iowa City/Fairfield vicinity — **Silicon Prairie**
Fairfield — **Silicorn Valley**

LOUISIANA

Entire state — **Silicon Bayou**

MAINE

Portland — **WebPort**

MASSACHUSETTS

Boston — **Cyber District**
Entire state — **Dot Commonwealth**
Area around Hudson — **Silicon Hill**
Hudson — **Silicon Mountain**

Boston suburbs (Route 128 loop) — **Silicon Necklace**
Cape Cod — **Silicon Sandbar**
North Adams — **Silicon Village**

MICHIGAN

Oakland County — **Automation Alley**

MINNESOTA

Area around Minneapolis/St. Paul — **Silicon Prairie, Silicon Snowbank, Silicon Tundra**

MISSOURI

Kansas City — **Silicon Prairie**
Band thru Kansas City/Columbia/St. Louis — **Silicon River**

MONTANA

Region around Kalispell — **Silicon Glacier**

NEBRASKA

Lincoln — **Silicon Plains, Silicon Prairie**

NEW HAMPSHIRE

Portsmouth — **e-Coast**

NEW JERSEY

Garden State Parkway — **Silicon Parkway**

NEW MEXICO

Albuquerque/Santa Fe/Los Alamos — **Silicon Mesa**

NEW YORK

Lower East Side, Manhattan — **Silicon Alley**
Long Island — **Silicon Island**

NORTH CAROLINA

Raleigh/Durham — **Silicon Triangle**
Catawba County — **Telecom Valley**

OHIO

Over-the-Rhine area, Cincinnati — **Digital Rhine**

OKLAHOMA

Payne County — **Silicon Prairie**

OREGON

Portland — **Silicon Forest**

PENNSYLVANIA

Philadelphia — **Philicon Valley**
Mountaintop — **Silicon Mountain**
Suburbs around Valley Forge and Wayne — **Silicon Valley Forge**

SOUTH DAKOTA

Sioux Falls vicinity — **Silicon Prairie**

TENNESSEE

Oak Ridge — **Silicon Hollow**

TEXAS

Austin — **Silicon Gulch**
Hills west of downtown Austin — **Silicon Hills**
Richardson — **Silicon Prairie, Telecom Corridor**
Ed Bluestein Blvd., Austin — **Silicon Prairie Texas**

VIRGINIA

Fairfax County — **e-Country**
Entire state — **Silicon Dominion, Silicon Plantation**
Northern Virginia, suburbs of Washington — **Silicon Holler**
Richmond — **Silicon Seaboard**

WASHINGTON

Seattle — **Silicon Forest, Silicon Rain Forest**
Whidbey Island — **Silicon Island**
Wenatchee Valley — **Silicon Orchard**

SOURCE: "TASTY BITS FROM THE TECHNOLOGY FRONT" NEWSLETTER WWW.TBTF.COM

A SELF-DESCRIBED CYNIC, former IT consultant Leo Kramer says he has no love lost for the Internal Revenue Service. And although he was aware that independent consulting involved certain tax reporting obligations, he blissfully ignored filing his annual tax return or keeping records of his expenses for three years.

Kramer (not his real name) is a New York-based IT professional who asked to remain anonymous. "Taxes just seemed too horrible to think about, so I just pretended they didn't exist," he recalls. "I guess I thought maybe the IRS would ignore me because I'm just a small fish in an ocean of corporate enterprises."

But the IRS has its ways of catching up with people, and, in 1994, Kramer got a letter demanding in excess of \$20,000 for back taxes and penalties.

"I was really scared, and I felt that I had to take some sort of action to get back into the good graces of the powers that be," Kramer recalls.

He met with an accountant, but without any records or receipts to back up his expenses, he had to pay the IRS the full amount due — including about \$3,000 in interest and penalties.

Although Kramer's case is a lesson in the extreme, it underscores that tax time can be a burdensome, overwhelming period for independent IT consultants. While IT professionals are advised to think with a business mind-set, as a group, they aren't particularly interested in business tasks. They would rather roll up their sleeves and dive into a technical conundrum than into Form 1040 Schedule C deductions.

Evidence of the anxiety that tax matters raise among IT consultants can be found in a forum on "Insurance, Taxes and Legal Questions" at RealRates.com's IT consulting community site. It's one of the site's most frequented discussion groups, generating over 2,200 postings since July 1999 — with the lion's share related to tax issues.

In the end, tax-related paperwork was one reason Kramer opted out of consulting. But tax time doesn't have to be overly painful.

Get Professional Help

The simplest route to easing your anxiety may be to hire a qualified tax professional.

Jeremy Bell, a principal at Crane Consulting in Alameda, Calif., says he retained an accountant as soon as he and his wife, Janet Crane, founded their shop in 1994.

"I had heard all kinds of urban legends about the IRS. I didn't know if they were true, but I didn't want to find out," Bell says. "If it came to an audit, the accountant would be prepared to represent me."



Tax Trials and Tribulations

Face it — paperwork isn't a high priority for most independent consultants. That can result in some sticky situations during tax season. Here's some advice learned the hard way to help keep tax time from being a taxing time. By Leslie Goff

But keep in mind that, like a computer, an accountant is only as good as the data you feed him. Tenacious record-keeping throughout the year will eliminate many headaches come tax time, says Juda Kallus, a New York-based enrolled agent, who represents taxpayers before all administrative levels of the IRS.

"Record-keeping is more important

to the IT professional than knowing the ins and outs of the tax law," says Kallus. "Entering your income and expenses and categorizing them in a software program will give you all the information you need to file."

Thorough record-keeping is one thing; understanding your allowable deductions is another. You should get

professional advice at some point. If you decide to seek out an accountant, practice due diligence.

Bell chose a firm that specializes in helping consulting businesses. "I don't want to pay their fees to educate them on my particular environment," he says.

Moreover, accountants who specialize are more likely to stay up-to-date on the parts of the tax code that have the most impact on IT consultants.

Kallus notes that while the tax code is the rule, regardless of your occupation, the following issues are particularly relevant to IT contractors:

- A change in the tax code in 1999 eased restrictions on the home office deduction. Before, many IT consultants couldn't deduct their home offices because they work primarily at client sites. Under the new IRS regulation, home offices that are maintained as the sole location for conducting administrative tasks, billing, research and meetings are deductible, Kallus says. Space used in your home to store hardware or software inventory that you resell to clients is also deductible.

- Training and education aren't automatically deductible — courses or seminars must relate to your current job. If you're a systems administrator who wants to pursue applications development, the IRS won't likely allow a deduction for a Visual Basic class, Kallus notes.

- If you've earned both W-2 (employee) and 1099 (freelance) income in the same tax year, Kallus says, you must track your income and expenses accordingly. Business expenses for W-2 gigs must be reported on Form 1040 Schedule A (employee-related job expenses), and those for 1099 contracts must be reported on Form 1040 Schedule C (profit or loss from sole proprietorship).

- If you earn income outside of your home state, you may be required to file tax returns in each state you worked. "It's a land mine of complications," Kallus says. Since independent IT consultants often subcontract work to other independents, be aware that if you pay more than \$600 to a 1099 contractor, you must file a 1099 form with the federal government; some states also require you to file 1099 forms, Kallus says.

Kallus notes that these are but a fraction of the deductions and caveats that apply to IT consultants. For a complete analysis of your tax liability, consult with a tax professional, check the IRS Web site (www.irs.gov) or refer to a reliable tax manual such as *J.K. Lasser's Taxes Made Easy for Your Home-Based Business: The Ultimate Tax Handbook for Self-Employed Professionals, Consultants, and Freelancers*, fourth edition, by Gary W. Carter (2001, John Wiley & Sons, New York). ■

Goff is a freelance writer in New York.

Quick Response

BY MARC L. SONGINI

TO IMPROVE efficiency throughout their supply chains, some companies have turned to quick response processes.

Quick response is a method that allows manufacturers or retailers to communicate inventory needs for their shelves or assembly lines in near-real time. These companies have traditionally communicated with business partners about inventory replenishment via electronic data interchange (EDI) systems, faxes or phone calls. But with the advent of the Internet, a growing number of organizations have been turning to Web-based systems.

High-profile companies that are either in the process of implementing or have installed such systems to boost the efficiency of their supply chains include Switzerland's Nestlé SA, San Francisco-based Levi Strauss & Co. and Toronto-based Canadian Tire Corp.

Advocates claim that quick response systems can help retailers and manufacturers trim the fat out of supply chains, speed up the time it takes to replace depleted inventory, help avoid stock-outs and boost the number of inventory turns (when a retailer or manufacturer turns over its entire inventory).

Companies that offer quick response technologies include SAP AG, Logility Inc. in Atlanta, GlobeRanger Corp. in Richardson, Texas, and i2 Technologies Inc. in Dallas.

Get Real

Quick response takes a variety of forms. "Real time is a different thing to different people," says George Brody, president and CEO of GlobeRanger. "So quick response means different things to different people." For instance, he says, for some folks, asking for data in real time might mean once an hour, for others, it might mean once a day.

The process requires a company to share what could be seen as proprietary data about

DEFINITION

Quick response is a process that uses real-time or near-real-time signals to trigger replenishment responses in the supply chain for manufacturers or retailers. This improves inventory turns, product allocation and replenishment times and helps retailers avoid running out of important stock.

its sales and manufacturing operations with its partners. Some executives might be hesitant about this for fear of exposing sensitive information about their companies' products or business strategies to their rivals, say observers.

Nevertheless, when implemented correctly, quick response can be an integral component in helping organizations create lean and efficient supply chains.

"Our supply-chain efforts are based on real-time customer information, quickness and speed," says a spokesman for Dell Computer Corp. in Round Rock, Texas.

On the Cutting Edge

Dell is widely viewed as being on the cutting edge of supply-chain management. For instance, if Dell.com receives an order from a customer for a DVD device, that request is passed along to Dell's suppliers. If the suppliers can't meet the demand for some reason, they will signal back to Dell, which will then notify the customer that the item is out of stock or unavailable.

Procter & Gamble Co. in Cincinnati recently detailed its own plans to establish a quick response system through its entire supply chain. The system is expected to connect a variety of participants, from raw materials suppliers through the manufacturer to distributors out to retailers and on to consumers, says a Procter & Gamble spokesman.

The firm, which makes consumer products ranging from Pampers to Pepto-Bismol, says

the system will help it manufacture the right products as needed and get them to the appropriate warehouses and distribution centers, thus reducing bloat in its supply chain.

This should result in happier customers, according to Procter & Gamble. "A key benefit for consumers is that the products are fresher," says the company's spokesman.

Hypothetically, this means that when a consumer buys a roll of paper towels, informa-

collected by a bar-coding EDI-based device at the cash register. The aggregated information is sent each night to vendors who then replenish the depleted shelves, says Karen Peterson, an analyst at Gartner Group Inc., in Stamford, Conn.

Flow Manufacturing

Other companies use quick response during so-called flow manufacturing. Whenever one unit of inventory is sold by a retailer, a signal is sent through

ucts to customers and attempt to forecast how much inventory is going to be required to meet future needs, according to O'Marah.

In fact, some major companies, including Canadian Tire, say that regular quick response is already past its prime. Canadian Tire is currently implementing software from Stockholm-based Industri-Matematik International Corp. that should allow it to locate inventory anywhere in its supply chain at any time.

The Next Big Thing

"Quick response is kind of outmoded," says Art Karrer, project manager at Pharmavite Corp., a maker of vitamins and health-related products in Mission Hills, Calif. The firm used EDI-based quick response techniques between its supply centers and distribution centers for one of its biggest partners, Troy, Mich.-based Kmart Corp., until seven years ago.

Pharmavite has since shifted to CPFR to realize greater efficiencies in forecasting and replenishment and to gain insight into retail sales cycles. The company is now using applications from Logility to establish CPFR links with Kmart.

Certainly, the Web is allowing companies to move closer to establishing real-time systems. In fact, in some industries it's becoming a necessity to do so because the Web allows supply-chain processes to move with greater automation and cuts out the need for phone and fax communications, says O'Marah. The Web also creates a common format for sharing data among manufacturers, suppliers, distributors and carriers, he says.

Moreover, Web-based quick response systems cost less than traditional EDI technologies, which means even more trading partners than before can connect via a quick response system, says Peterson.

Nevertheless, some firms are unwilling to pay to replace legacy EDI systems, so those systems will likely remain in place for some time to come. ■

PROCTER & GAMBLE plans to create a quick response system throughout its supply chain as part of its effort to establish connections from raw materials suppliers through manufacturers to retailers and the consumers who visit Web sites like this one.

tion about that purchase goes all the way through the supply chain to the lumber company that cuts down the trees to make the product.

Procter & Gamble plans to install its quick response systems over the next few years; the company has pilots scheduled throughout this year.

Quick response systems have been around for about seven years. In the grocery industry, where the use of these technologies has been fairly prevalent, point-of-sale data is

the supply chain to replace it immediately, according to Kevin O'Marah, an analyst at AMR Research Inc. in Boston.

That's slightly different from collaborative planning, forecasting and replenishment (CPFR) processes, which are closely related to traditional quick response methods but are Web-based and slightly more sophisticated.

CPFR processes, say industry experts, let retailers and manufacturers examine statistics regarding the flow of prod-

Dear Career Adviser:

I've spent 12 years working in the insurance industry and the past four years programming insurance applications in Micro Focus Cobol. My company was recently sold, and I want to get out of Cobol programming and into

Web technologies and e-commerce. I have Java training but no experience. I have two job offers. One job involves working on the support team for Web application servers. This includes networking, TCP/IP, firewalls and security. I have good customer support skills, and the company is willing to train me. The second job involves doing system testing on a Web application. Java developers do the coding. Which is the better choice?

— PREMIUM POSITION

Dear Premium:

Testing is probably the weaker of these two choices, says Susan Cole, a recruiter at technology placement firm Donahue & Moore Associates Inc. in New York. While Web initiatives are hot at financial, brokerage and insurance companies, your second choice only involves testing Java applications using automated tools, and you wouldn't be getting any hands-on Java development experience.

To make this choice worthwhile, you would really need

to be offered hands-on Java development training, says Cole. Furthermore, you should learn automated Web testing tools such as Mercury Interactive's WinRunner and LoadRunner and Segue Software's Silk to increase your value in the quality-assurance testing marketplace.

Alternatively, knowing how to secure networks and handle the risks of doing business on the Web are key to the e-commerce initiatives at major banks, insurance companies and brokerage firms.

Your career would blossom, Cole says, by learning firewall packages such as Check Point Software Technologies' FireWall-1, SonicWall Pro and Cisco Systems' Secure Pix, including how to install them and how to secure a network. True expertise requires two years of increasingly responsible security roles, learning different packages and becoming certified.

Dear Career Adviser:

I'm a vice president of network server operations at a

Fortune 100 company. I have an engineering degree, some graduate computer studies and more recent courses in technologies relating to e-business such as infrastructure design and security. I'm an avid e-business technology follower, but given the recent "dot-bombs," I fear e-commerce is in a downward trend.

— EMOVER

Dear eMover:

Many new e-commerce companies are doing just fine, and more mature companies are rapidly adopting e-business initiatives, notes John Roberts, CIO of diCarta Inc., a Redwood City, Calif.-based company that provides Web-based business-to-business contract management software that automates the contract process from negotiation through renewal.

You might find interviewing at young e-commerce companies exciting. But realistically, because of your technical skills, compensation and large-organization political savvy, your career is

more apt to grow at larger venues rather than smaller e-commerce vendors or Web implementations.

Direct your search toward larger e-commerce technology vendors of the magnitude of Commerce One or Ariba or companies like Amazon.com, whose network-critical e-business implementations have huge needs for high uptimes and scalability.

Or, with your organizational savvy, expand your choices by moving out of network operations into a CIO role or by moving into the realm of big consulting companies.

Dear Career Adviser:

I have a compensation question. I'm a CIO becoming a chief operating officer at a \$40 million company whose revenue we hope will expand to \$100 million over the next two years. The company's product set is in the database product development and data mining arena. What are the standards for negotiating a senior compensation package?

— TOP GUN

Dear Top:

Compensation at this level may involve some or all of

these components: base salary or cash compensation, sign-on bonuses, stock options, warrants convertible to stock, immediately vested

stock, performance rewards, severance packages and other perks.

Not every company provides all of these elements, and they can vary widely. Base cash compensation may vary from a low of \$100,000 to more than \$300,000 annually. Some companies provide sign-on bonuses of

\$50,000 or more and immediately vested stock; others don't.

Ownership percentages also vary. Your best gauge is to find out the compensation packages, stock included, of the company's vice president-level hires. If vice presidents have 1% to 2% of the company, an incoming CEO might garner 8% to 10% of the firm, which might ultimately become 3% to 4% of the company fully diluted.

Finally, make sure to get a lawyer's advice, urges San Francisco-based venture adviser Irv Weiman. Your employer may choose to reward you within or outside of its current incentive stock option plan, and there could be tax consequences for the company and for you. ▀



FRAN QUITTEL is an expert in high-tech careers and recruitment. Send questions to her at www.computerworld.com/career_adviser.

BRIEFS

Controversial Privacy Bill Back in House

A bill that critics say could put the brakes on privacy legislation for the next two years was reintroduced in the U.S. House of Representatives last week. The Privacy Protection Commission Act, sponsored by Reps. Asa Hutchinson (R-Ark.) and Jim Moran (D-Va.), would create a 17-member commission to study privacy issues. The bipartisan commission would have 18 months to deliver its legislative recommendations to Congress.

Opponents argue that the measure would be used to table privacy

legislation, but supporters say the bill doesn't block Congress from acting on privacy issues without the commission's recommendations. The bill narrowly failed in the House last fall in a 250-146 vote - 14 votes shy of the two-thirds approval needed to pass.

Nordstrom.com Gets Data Warehouse

Seattle-based retailer Nordstrom Inc.'s online shopping site, Nordstrom.com, has signed an agreement with Kirkland, Wash.-based online service provider digiMine Inc. for data warehousing and business intelligence services. Nordstrom.com officials said the services will give it timely feedback about cus-

tomers' interests, Web site performance, content and product consumption, browse-to-buy conversion and marketing campaign effectiveness.

Buy.com Execs Out

Online retailer Buy.com Inc. in Aliso Viejo, Calif., last week announced the resignations of Gregory Hawkins, its chairman and CEO, and Mitch Hill, its chief financial officer. Board member James Roszak, the retired president of the life insurance division of Transamerica Corp. in San Francisco, will serve as interim CEO. Another board member, Donald Kendall, the retired CEO of PepsiCo Inc. in Purchase, N.Y., was appointed the new chairman of the board. Robert Price, who most

recently worked for PairGain Technologies Inc., has been named CFO.

The management shake-up follows a major restructuring announcement made earlier this month, in which Buy.com said it planned to cut its workforce by 10%, sharply decrease the number of products it sells and close or sell off all of its international Web sites.

Lockheed Launches Global Integration

Bethesda, Md.-based Lockheed Martin Corp. has chosen McLean, Va.-based XMLSolutions Corp.'s Business Integration Platform to integrate legacy systems within its global operations and to handle business communications with

members of the Exostar Inc. exchange. Reston, Va.-based Exostar is an electronic marketplace for the aerospace and defense industry.

Security Firm Taps Executives

Digital security services firm Guardent Inc. in Waltham, Mass., has named Edward Schwartz, a former chief security officer at Nationwide Insurance Cos. in Columbus, Ohio, as its new vice president of strategy. Guardent also named Gerard Brady, a former vice president of emerging technology at Internet Security Systems Inc. in Atlanta, as its new vice president of research and development.



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TECHNOLOGY

IS THIS THE END OF PRIVACY?

IN A WORLD OF always-on communication, sophisticated data mining and ubiquitous monitoring by advancing technologies, privacy as we know it seems to be in jeopardy. Increasing numbers of people choose convenience over protecting personal information, but the key to preserving some notion of privacy is making sure the choice is there, say experts *Computerworld* spoke with for this week's Future Watch.

58

SECURE B2B ASPs

Application service providers are trying to find a way to tie customers into your back-end financial systems without compromising security. Bolt-on security is convenient, but ways to achieve it are far from standard. ▶ 52

E-SAFE DEPOSIT

A Chicago bank is offering users virtual safe deposit boxes in which they can store electronic documents and then share them securely over the Web with lawyers or business partners. The bank's service provider is Free-Drive, which claims 11 million customers for the off-site, fault-tolerant storage system. ▶ 53

AUTOHELP

Start-up Attenza, formerly Service911.com, helped Visa automate its online help desk, providing the content Visa spent months and hundreds of thousands of dollars pursuing. Users like Visa and Egghead like the prepackaged help, but analysts say other vendors can offer similar services. ▶ 62

A MAGICAL WEB CAREER

David Holland is fulfilling a lifelong interest in magic and comics, making the Web come alive at Dark Horse Comics. But as a Web application developer, he's responsible not only for outside customers but also for making sure internal staffers have the online tools they need. ▶ 64



POLLY BECKER

ASPs Tout Advanced E-Business Security

Providers using increasingly sophisticated tools to authenticate users over the Web

BY MARK HALL

WHEN FMC Corp. recently sold 40 boxcars of soda ash, one customer used a browser to enter confidential order information directly into the company's SAP system — or so he thought. What the customer really used was a sophisticated secure proxy server from service provider Aventail Corp.

"Aventail was a bridge behind our firewall that directed Web users to a proxy server. It looked just like they were in the back end. But that's not the case," said Craig Watson, CIO at Chicago-based FMC.

Application service providers (ASP) are now delivering increasingly sophisticated security products that corporations can adopt for their e-business initiatives without having to develop anything themselves. And it's happening just in time, as more IT organizations like FMC outsource Internet infrastructure, Web services and other operations.

"Our business model depends heavily on per-use managed services," Watson said. "We do everything by the drink."

Beyond the VPN

When Suzanne Pawlisz, FMC's IT program manager, was investigating managed services early last year, they weren't as sophisticated as those she now gets from Seattle-based Aventail. With Aventail's service, Web users are authenticated and then given rights and privileges for application and data access. Previously, only users of FMC's virtual private network (VPN) were able to breach the firewall to get work done.

Pawlisz said Aventail's extranet technology, Aventail-Net, uses a "noninvasive agent" that leaves the client system's IP stack data alone, unlike a VPN, which uses a client's IP stack data.

The Aventail agent handles the initial setup between the server, which is housed at Beltsville, Md.-based Digex Inc.'s data center and, say, a user's remote PC. The Aventail-Net product authenticates a user and then permits him to use only the applications he's authorized to access.

But it takes one more step. Unlike a VPN, which normally passes a user onto the server system where the application resides, all of the user's applications and services are packaged and sent to the remote Aventail server, so the external user never actually contacts FMC's own server. Data moving between the Aventail proxy

host and the real server is automatically checked for viruses and other security problems.

According to Colleen Niven, an analyst at AMR Research Inc. in Boston, ASPs are currently using advanced security that "reminds you of [military] stuff." In fact, earlier this month, Nupremis Inc. in Boulder, Colo., introduced what it calls "military-grade network security."

This advanced security is being touted by ASPs as a differentiator, Niven said, but in the future, "high-level security will be considered the norm."

Pawlisz said she's not expecting her ASP to sit still. Aventail is currently working on synchronizing its authentication process-

es with Microsoft Corp.'s Active Directory feature in Windows 2000, which FMC will be rolling out this year.

George McNulty, director of technology at Wizmo Inc., an Eden Prairie, Minn.-based ASP, already has data synchronization worked out for his customers. He uses Novell Inc.'s iChain security application with Novell Directory Services (NDS). NDS is ideal for handling ASPs' directory management synchronization hassles, he said.

Authenticated users are sent to an available server in Wizmo's data center along with their access privileges, said



WATSON: "Our business model depends heavily on per-use managed services."

McNulty. As users switch from application to application during the course of the day, they often change servers, and when they do so, all of the rights and privileges they were granted initially go with them. Data resides in a storage-area network and is

AT A GLANCE

Extra Secure

How FMC uses Aventail-Net extranet security:

- The Web client connects to the hosted Aventail-Net server.
- Aventail-Net authenticates the user.
- Application access rights and privileges are linked to the user.
- The application and data are loaded onto the Aventail-Net proxy server at the ASP's data center from various FMC servers.

doled out only according to need, McNulty said. NDS manages all of the synchronization, even if a user's rights change in the middle of a session.

ASPs have to work hard at establishing security, said McNulty, because most of their applications haven't been designed from the ground up for Web use.

But Niven said that's beginning to change. She pointed to improved security in Oracle9i's Virtual Private Database feature, which was specifically improved for ASP use. ▀

ICAP Open Standard Could Ease Net Server Integration

BY MATT HAMBLIN

To reduce the risk of malicious ActiveX files being sent to employees' desktops via the Internet, Germany's second-largest bank recently began weeding them out using a new open protocol.

Although only a skilled hacker would be able to enter a PC through ActiveX files, HypoVereinsbank didn't want to open a door to attacks on the client PCs in its 1,400 offices that are used by many of the bank's 46,000 workers, said Thomas Zaech, the Munich-based bank's Internet access manager.

To scrub out the questionable files, HypoVereinsbank in December deployed filtering software from Webwasher.com AG in Paderborn, Germany. This software relies on the Internet Content Adaptation Protocol (ICAP), a recently developed open standard for Internet proxy servers to communicate with content servers.

With the open standard,

Zaech said, it will be easier to integrate various software and hardware products than it would be using proprietary application programming interfaces (API).

Zaech said the Webwasher technology will cost HypoVereinsbank about \$470,000 over several years, including support.

'Freedom of Choice'

The ICAP Forum in Sunnyvale, Calif., boasts a membership of more than 60 vendors, including Oracle Corp., Novell Inc. and smaller firms that provide Internet services, caching servers, hardware and security.

On Jan. 22, after more than a year in existence, the forum released Version 1.3 of the ICAP specification, which was recently submitted to the Internet Engineering Task Force for review.

Officials of the ICAP Forum claim that the open standard will make it possible for products to communicate and

scale more easily, especially when compared with proprietary APIs.

"The ICAP approach gives us freedom of choice," Zaech said. "With API-based solutions, such as Netscape's proxy server, you're locked on a specific solution. I am able to combine the best-fitting cache with the best-fitting add-on."

Analysts said that with the ICAP approach, vendors could sell products tailored to help firms keep pornography, viruses and other objectionable material from entering their corporate PC networks via the Internet. Through an open approach, a firm can use a range of devices, whereas an API might work with only a small number of vendors' hardware and software products, analysts said.

William Hurley, an analyst at The Yankee Group in Boston, said a major objective of the ICAP Forum is to ease the distribution of content around the Internet. This effort would help vendors and could also help end users, he added.

"Ultimately, it can drive costs

down for enterprise users," Hurley said.

Two other standards groups were formed last year to work toward efficiency in internetworking: The Content Alliance, a creation of Cisco Systems Inc. in San Jose; and Content Bridge, whose members include Inktomi Corp. and Sun Microsystems Inc.

"As these protocols mature, they will allow managers of networks to make intelligent decisions about what types of traffic to allow over a network," Hurley said.



ZAECH: Protocol wards off Net-based attacks by monitoring Web servers.

John Pescatore, an analyst at Gartner Group Inc. in Stamford, Conn., said that he first learned of ICAP more than a year ago but that "it just hasn't caught on in the U.S." That will change as more internetworking devices combine functionality, he added.

For example, major vendors such as Intel Corp. are developing a single device that sits on the edge of a Web server farm and provides caching, load-balancing and Secure Sockets Layer acceleration for all the Web servers, Pescatore said. ▀

Bank Offers Virtual Safe-Deposit Boxes for Storing Data

BY LUCAS MEARIAN

In what's being pitched as a time-saver and disaster recovery tool for consumers, a small Chicago bank has invested in a Web-based service that will allow its customers to store electronic documents and photos in online safe-deposit boxes.

For \$50 per year, any of New Century Bank's 900 customers can have access to 50MB of password-protected online storage through FreeDrive Inc., a Chicago-based storage service provider.

FreeDrive offers free online storage over the Internet, making its profit from online ad sales. It says it currently has 11 million customers.

"One of the things FreeDrive or any Web-based account allows you to do is share that data which you can't from home unless you make an e-mail attachment," said Mark Papadas, corporate accounts manager at FreeDrive.

For customers, the value of an electronic storage service offered by a bank such as New Century is that it provides easy access to legal, banking or other personal data.

Secure Sharing

Customers can also share that information with their banks, lawyers, business partners, family or friends by simply giving them an access code, according to Marc Pershan, New Century's director of private banking.

Users of the service can create files and then set sharing parameters for each document and designate them as either public or private.

The bank also plans to eventually offer its customers the use of digital cameras with the safe-deposit box service so that they will be able to document possessions for insurance purposes.

According to FreeDrive President Dave Falter, the service also affords greater security than home electronic data storage.

FreeDrive contracts with IT service giant Electronic Data Systems Corp. in Plano, Texas, to manage its storage. EDS uses storage arrays from EMC Corp. in Hopkinton, Mass. The arrays are configured for triple mirroring of data for fault tolerance.

On Feb. 16, FreeDrive released a service similar to its online safe-deposit box for corporate customers.

The service, named CompanyDrive, lets businesses share blueprints, presentations and other electronic media with-

out replication of the original files.

"People are using e-mail as the late-20th-century pack-

mule," Falter said. "If you have something I want to see, the current format is to send it along in an e-mail attachment. That creates between six and 60 times replication of e-mail inside the firewall." ▀

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New Security Manager Starting at Ground Zero

Filling a newly created job, 'Mathias Thurman' faces both technology and management issues

Editor's note: Last week, *Security Manager's Journal* contributor Jude Thaddeus decided to pass the baton, but our new author, "Mathias Thurman," is ready to take the next lap. New to management and with a fancy title, Thurman faces the daunting task of creating a security infrastructure at a rapidly growing start-up company. He's got the job. He's got the budget. Now he just needs a plan.

I LIKE WORKING for start-ups. One of my passions in life is helping to build things, and start-ups give me that pleasure. So now I've gone and done it. I've joined a small start-up company where I'm the first security professional on board. My previous experience has been mostly hands-on engineering, project leader and analyst positions. This time, however, I've been hired as the manager for enterprise security.

My company writes its own software and makes it available to clients over the Internet via a standard Web browser. Our infrastructure is fairly small: slightly fewer than 50 servers. However, the application architecture is complex and highly managed. Front-end Apache Web servers talk to midlevel in-house-developed application servers, which talk to back-end Oracle database servers. It's a three-tiered architecture with many interdependencies.

The company administers its own network, servers and applications. And we're building a state-of-the-art operations center that will monitor our production servers — which are currently hosted at a service provider's site — complete with all the bells and whistles, man traps and biometrics. We have about 25 sales and professional service offices worldwide, all using virtual private network connections to our corporate intranet for such things as e-mail, Web access and file sharing. We also have several other areas: preproduction, staging, quality assurance, de-

velopment and probably others that I have yet to discover.

I was hired after my employer hired a security consulting firm to accomplish one of those third-party, \$30,000, three-week audits. If you've never had the pleasure of having some computer hackers dedicate three weeks of their lives to fully exploiting your entire livelihood, then you don't know what you're missing. It's amazing and well worth the money. We did fairly well. However, there were some glaring issues that need to be addressed.

One audit report recommendation was to hire a security manager and build a team. So, here I am. I report directly to the CIO. I've been told I have a substantial hardware and software budget to work with, and I have a generous budget to hire two security engineers. I've started by creating a list of short-term projects.

The Plan

I'll review the audit and immediately address the critical findings. I'll also develop a project plan to address the additional findings, get acquainted with the managers in all departments, become intimately familiar with the network and applications and develop a cross-functional team using people from different departments.

In addition, I've started putting together my shopping list: an intrusion-detection system (IDS), file integrity-checking software, two-factor authentication infrastructure, vulnerability assessment tools, secure administrative software and the hardware to support these applications.

The company already has made a significant investment in Pix firewalls from San Jose-based Cisco Systems Inc., so I'm not going to switch. The network engineering department has been administering the firewalls, and I'll leave that in place and just do audits of the rule base.

I'm currently in the evaluation stages

of picking an IDS. I've narrowed it down to SafeSuite from Atlanta-based Internet Security Systems Inc., the NFR Intrusion Detection System from Washington-based NFR Security Inc. and a fairly new but well-respected tool called Dragon, from Rochester, N.H.-based Enterasys Networks Inc. I have to pick one that will incur the least amount of administration, can handle a large portion of our network traffic and is cheap. I'll supplement this tool with some shareware and homegrown assessment tools.

For file integrity-checking software, nothing beats Tripwire software from Portland, Ore.-based Tripwire Inc. It actually has a new, centralized management console that can talk to all other machines using Tripwire and allows on-the-fly policy file changes, scheduling and reporting. Neat stuff.

I'll use ACE/Server from RSA Security Inc. in Bedford, Mass., and get a bunch of SecurID tokens to handle my authentication needs. Antivirus software vendor F-Secure Corp. in Espoo, Finland, has a fully supported version of the Secure Shell (SSH) secure session program, which is even reported to be able to utilize SecurID tokens through a RADIUS server (see glossary). The use of SecurID tokens and SSH has always been a problem in the past because the two couldn't work together.

Getting Physical

In addition to system and network security responsibilities, I'm also in charge of physical security. Fortunately, the funds will come out of a different pot of money, but I'm still responsible for identifying the requirements, which I feel should include picture identification access badges, card readers, closed-circuit TV equipment and a centralized alarm system.

I'm also thinking of a biometric system for our network operations center (NOC), which is currently under construction. Not that I'm so worried about unauthorized access. Biometric systems look cool when you walk a customer through the NOC. I believe it's worth the money if we land one big contract because of it. Initially, and until I have the time to get involved, I'm going to try to maintain an oversight function and let the facilities manager handle the physical security.

This is actually my first job in which I'll hold the title of manager. I've had

THISWEEK'S GLOSSARY

SSH: Secure Shell is an industry standard program that provides for encrypted remote user sessions and allows users to create public and private keys to control sessions. Both commercial and shareware versions are available.

SecurID token: A randomly assigned number, assigned by a small device the size of a credit card, that can be used in combination with a personal identification number to provide an additional level of authentication for resource access.

RADIUS server: Remote Authentication Dial-in User Service (RADIUS) allows multiple servers and devices to pass authentication information to a single machine. A RADIUS server contains the authentication information.

Two-factor authentication: An authentication scheme that requires users to divulge something they should know and something that they have or "are." A normal user ID and password pair isn't considered two-factor authentication, but a user ID/password combined with a digital token or a fingerprinting scanner is.

Man trap: This is usually a corridor in the computer center that traps intruders in the event that they are able to bypass initial physical security controls.

LINKS:

www.iss.net: Internet Security Systems Inc.

www.enterasys.com: Enterasys Networks Inc.

www.nfr.com: NFR Security Inc.

www.securitywizards.com: Network Security Wizards Inc.

www.f-secure.com: F-Secure Corp.

www.rsasecurity.com: RSA Security Inc.

www.tripwiresecurity.com: Tripwire Inc.

www.cisco.com: Cisco Systems Inc.

management responsibilities before, but never the title or budget. With a limited budget and worldwide presence, maintaining a robust security infrastructure will be a challenge. The rest of the week will be spent meeting staff, getting acquainted with our infrastructure and calling vendors to start the negotiations. I'm the security manager, and I've got some money to spend. ■

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We Secure the Internet.

Laptops Large and Small

Two outstanding models give you quite a choice in both size and price. By Russell Kay

YOU CAN NEVER be too rich or too thin, the saying goes. That same observation can be applied to notebook computers as well. Recently, I've been using two systems that exemplify those two ends of the notebook packaging spectrum. One is rich — a big, do-everything desktop replacement that's remarkably inexpensive, by traditional laptop standards. The other is thin — a light, 1-in.-thick ultraportable that's aimed at the road warrior who's willing to trade some features or flexibility to lose significant weight.

Obviously, these two machines don't compete with each other. They're designed to meet different users' needs, and each does a very good job within its specific niche.

SATELLITE 2805

■ **Toshiba America Information Systems Inc., Irvine, Calif.**
■ www.toshiba.com
■ **Starts at \$1,299**

The big bruiser here is Toshiba's Satellite 2805, and it is big. With a 14-in. screen, plus both DVD and floppy-disk drives, it checks in at 7.3 lb. Yet its price (after a couple of recent drops) is just \$1,799. The unit I tested, Model S30I, has a 650-MHz Pentium III CPU, 128MB of RAM and a 10GB hard drive. Toshiba has announced a refresh of this model, with a

700-MHz processor and 10GB hard drive. A 650-MHz Celeron-processor-equipped model with 64MB of RAM, a 6GB hard drive and a DVD drive is available for \$1,299.

The Satellite 2805 has everything built into one box, and it makes a great and economical desktop replacement. With its included 56K bit/sec. modem and Ethernet port, it's ready for business. The keyboard is good, the screen's large and bright, and you can get it with a 15-in. display for a few hundred dollars more. The built-in floppy drive — something that's becoming increasingly rare — is quite convenient for minor backups, "sneakernet" transfers and installing the occasional bit of software or a hardware driver that comes on a floppy disk.

The sound on the Toshiba is remarkably good. Credit for that goes to the inclusion of two good stereo speakers and a subwoofer (though it feels strange to use that term for any speaker small enough to fit in a laptop). In fact, when this model was under development, the designers discovered that the subwoofer delivered enough bass energy to cause vibration problems with the internal hard drive. They fixed that problem, of course, but the

computer does provide good-sounding bass that's all out of proportion to the unit's size.

Not that you can forget that size, which is considerable. This is the biggest (though not the heaviest) laptop I've ever dealt with. The optional 15-in. screen doesn't visually overpower the rest of the unit (as with some other big-screen laptops), because everything here is on a massive scale. This unit won't even fit into many laptop carrying cases. But its size allows for a full-size keyboard and three built-in drives. It dwarfs my Dell Latitude, which I've always considered large. You don't want to carry this one very far,

but once you're settled down and working on it, it's a nice system.

OMNIBOOK 500

■ **Hewlett-Packard Co.**
■ www.hp.com/omnibook
■ **Starts at \$1,844**

The lightweight lad here is HP's new Omnibook 500, which I'd describe as HP's counterpart to the IBM ThinkPad X20 [Technology Hands On, Oct. 16]. With a 12-in., 1,024- by 768-pixel Extended Graphics Array (XGA) screen, it's just 1 in. thick, weighs only 3.5 lb. and starts at \$1,844 with a Celeron 500-MHz CPU and a 7.5GB hard drive.

Included in the package is a 2-lb. multimedia base that holds both floppy and extra-cost optical drives. The notebook clips securely onto this base, making a total package that still weighs less than most notebooks on the market. The two-piece design lets you pack the base in your checked luggage when you're traveling, so you need only carry the lightweight Omnibook.

In many ways, the Omnibook 500 incorporates the best features from its competitors (including Toshiba's Portege 3480CT) while eliminating their weaknesses. Like the ThinkPad, it has a good keyboard, a 12-in. screen and a versatile multimedia base. But even in its cheapest model, the

Omnibook's screen is somewhat brighter and has full XGA resolution; the Celeron-based ThinkPad gives you only Super VGA (800 by 600 pixels).

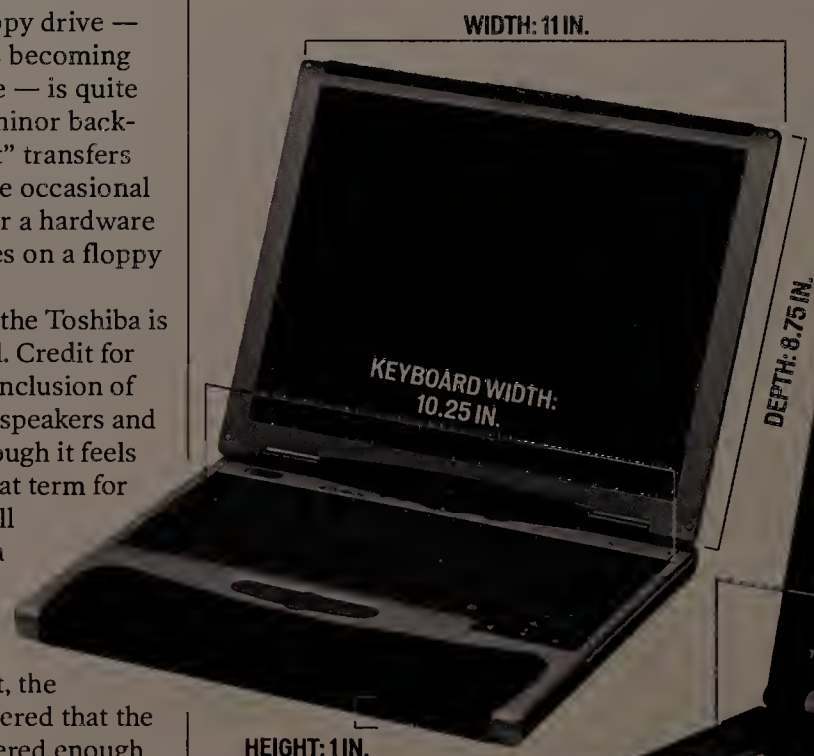
Unlike the Portege 3480CT, the Omnibook's multimedia base is really usable. (The Toshiba's holds only an extra battery, with no drives at all). And the 12-in. screen certainly beats the Portege's 10.4-in. display. The Toshiba's floppy and optical drives hang off the system on special cables.

I didn't like the latch that secures the HP's display; I found it unnecessarily hard to open.

Finally, I really like the Omnibook's use of a light-gray color on the case and keyboard. I'm tired of black and charcoal-gray laptops; for me, HP's lighter color scheme is more pleasant to use, especially if I'm in an environment with subdued lighting.

It should be clear that I really like the Omnibook; it's the class of notebook that I find most appealing, combining full features with light weight. The only real drawback is a "small" 12-in. screen. In fact, I remember reviewing in 1996 (but not for *Computerworld*) the first notebook computer to use a 12-in. screen, and it seemed simply enormous at the time. Now, a 12-in. screen is considered small. Well, small is beautiful, too. ▀

Omnibook 500



HEIGHT:
1.75 IN.

Satellite 2805



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WANT TO LEAD?
Do you have what it takes to inspire and influence others? CIOs reveal what they look for in potential leaders. Page 54

E-COMMERCE PITFALLS
Web shopping may be easy, but technology problems and poor processes could keep the customers away. Page 48

XML GETS BUSY
XML starts to deliver on its starry-eyed promises, but with every silver lining there's a cloud or two. Page 78

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MORE MANAGERS MONITOR E-MAIL

Computerworld survey: Fearing lawsuits, loss of secrets, employers scan more worker messages

BY DOMINIQUE DECHRYN
Spot checks just aren't good enough anymore. The tide is turning toward systematic monitoring of corporate e-mail traffic using content-monitoring software that scans for troublesome words according to an exclusive Computerworld survey.

About 38% of 75 corporate e-mail managers already use monitoring software either regularly or for spot checks. Of those who don't, 21% plan to install it next year, according to the survey.

The reason: Users of monitoring software said they're concerned about protecting their intellectual property and guarding themselves against litigation.

Put It in Writing
Four points that should be in an e-mail policy:

- A statement that computer systems are the company's property and are to be used for business purposes only.
- A clear definition of what is and isn't appropriate use of e-mail.
- A statement to employees that they can't expect e-mail to be private and that all e-mail may be monitored.
- An explanation that violations can lead to disciplinary action, up to and including termination.

REPORT: CODE QUALITY TO TAKE A HIT
ance departments as they have pulled specialists onto their Y2K projects. The trickle down effect, according to Meta Group, is that few of these companies will redeploy their quality teams, so application development error rates will increase.

Meta Group's software quality assurance research, which is drawn from its "Worldwide IT Trends and Benchmark Report," is based on survey responses from information technology executives at 318 of the world's 2,000 Code Quality, page 97

HOLDING IT ACCOUNTABLE
NEW ACCOUNTING STANDARD for software development will force dramatic changes in the way IT projects are run, reports Kathleen Melymuka.

The bookkeeping rules require much greater discipline in project management and, like Y2K, they can't be ignored — not with the SEC watching. IT departments will need to keep detailed records of the time spent on tasks so that internal software costs are correctly fed into the general ledger. Application development units that can't handle these chores may be replaced by an outsourcer that can.

Report begins on page 46.

APPLICATION DEVELOPMENT

CONTRACT DEVELOPMENT
But many CIOs defend integrity of software

BY THOMAS HOFFMAN
As if the year 2000 problem wasn't enough of a Pandora's box, here's another one for IT organizations: Software developed by user companies next year could be buggier than ever.

According to soon-to-be-released research from Stamford, Conn.-based Meta Group Inc., more than half the world's biggest companies have disbanded their in-house software quality assurance

MERRILL LYNCH'S JOHN MCKINLEY
diagnoses with Meta Group findings

MERGER SPURS IT COST, JOB CUTS
ConEd/Northeast see pressure to cut rates

BY JULIA RAB
Consolidated Edison's \$3.3 billion merger with Northeast Utilities is bound to trigger sharp cost-cutting plus employee layoffs within the two companies' IT groups, analysts said last week.

"The merger means an immediate redundancy in the IT infrastructure, plus deregulation means tremendous pressure to cut rates," says a source familiar with the merger, page 97

CAN ACQUISITION STAY HEALTHY?
Aetna/Prudential face data challenges

BY THOMAS HOFFMAN
Aetna Inc.'s top IT executive said his company is set to absorb as much major health insurance acquisition in three years with the takeover of Prudential HealthCare.

But Wall Street analysts and health care consultants warned that despite its merger and acquisition experience, the Aetna, page 16

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WHAT DETAIL of your private life would you least like to see splashed across the Internet? Or added to a database, linked to your name and sold in a mailing list?

Your concern could become a source of amusement to your grandchildren, because by then, "privacy as we know it won't exist," predicts Nick Jones, a London-based research director at Stamford, Conn.-based Gartner Group Inc.

Global Positioning System devices may track your every move. Always-on communications will keep you reachable. Ubiquitous video-monitoring software will note changes in your behavior. Your financial, medical and other data will be collected from halls of records, hospitals, your doctors' offices, banks, the schools you attended, your employer and dozens of databases and placed in a single smart card. Use the card at your local gas station and you could expose those personal records.

In fact, much of that is already happening and raising some alarm, says Franklin S. Reeder, chairman of the Computer System Security and Privacy Advisory Board, which advises Congress and federal agencies.

The federal government is responding by passing such laws as the Health Insurance Portability and Accountability Act, which requires health care organizations to protect the confidentiality of patient information.

But while discussions continue about the role of the federal government in protecting privacy, the importance of building choice into IT has emerged as an equally important issue, Reeder says. "As people want more convenience and are willing to accept greater levels of intrusion to get that convenience, we have to be able to let them choose that. At the same time, we need the option to preserve anonymity," he says.

"Our view of what we're willing to show to the world varies from individual to individual, and it's probably a moving target," he adds.

Social Requirement, Not a Skill

That target will continue to move, says Jones. Once the major opportunities for using IT to improve industrial and business processes have been exhausted, "the main driver for the adoption of an advanced technology will be the degree to which it satisfies the higher human needs," he says. "Technoliteracy will be a social requirement, not a job skill."

For example, Jones says, Short Message Service (SMS), a wireless messaging system allowing up to 160 characters, overnight became "integral to the

social life of Finnish teens." Teens use SMS to stay in constant touch with their peers.

Within 10 years, "40% of adults and 75% of teens will have always-on, wearable computing and communications capabilities," says Jackie Fenn, another Gartner analyst. "Social constellations" — groups of colleagues, friends and family — will use IT to stay informed of one another's whereabouts and accessibility, she says. A built-in video camera, already developed as a prototype by San Francisco-based Levi Strauss & Co., will let others see what you see as you see it, engendering a kind of shared voyeurism, says Fenn.

Today, for the price of a Web camera (about \$99), hundreds of individuals offer an intimate view into their lives on the Web at www.citizenX.com.

CitizenX participant and digital artist Steve Lareau is matter-of-fact about the webcam he says he's had trained on himself for "quite a few years. I just unplug it or turn the cam away if I need privacy."

Video monitoring is already so common as to be unremarkable, Jones says. "The average New Yorker is photographed something like 23 times a day" by video cameras in stores, offices and public buildings or by traffic cameras on the street, he says.

"It's funny," Reeder says.

"We resist the picture of society George Orwell painted in 1984, but there was not a huge hue and cry when cameras were mounted at stoplights."

The perceived benefit to the public — nabbing reckless drivers — offsets the intrusion, Reeder speculates. "Individuals have a history of giving up some rights to privacy in exchange for the benefits of being part of a society."

Researchers in London's Underground public transit system are saving lives by using video cameras and behavioral indicators to identify potential suicides, Jones says. "Researchers have found they tend to hang around the end of the platform for a while before they make their attempt," he says.

As beneficial as such projects may be, however, they're like a genie let out of the bottle. By analyzing surveillance tapes and correlating the information to a database of known characteristics of individuals, an insurance company might note that you're gaining weight, thereby increasing your risk of heart attack, and use that information to justify raising your rates, Jones says.

Even now, an insurance company, through mining of public records, can find out if one of its customers has bought a car, says Fenn. It then has a couple of options. The company can contact him, she says, "and say, 'Hey, we see you just bought a new car and we'd like to offer you a good deal on insuring it'" — an approach the cus-

NO

Privacy as we know it may not exist in a future of wireless, always-on communications.
By Sami Lais



POLLY BECKER

More Secrets?

tomer might well see as an invasion of his privacy. Or the insurer can send the customer a blind offer on a good deal insuring a car, she says. The response elicited might be more like, "Hey, isn't that a coincidence. I just bought a car, and here's this good deal on insurance for it." Good idea?

Bad idea, says Alan Neustadt, a sociology professor at College Park, Md.-based University of Maryland who is studying the effects of the Internet on society. "I think ultimately, people want some kind of honesty," he says. "To deny you know and then have people find out you knew would be worse. Then you're a corporate voyeur."

It comes down to individual perceptions, says Reeder. "What constitutes an invasion of privacy to one person is a welcome convenience to another."

Tollbooths can read smart tags on a car and let it breeze through without stopping, but that "notionally give[s] the government the ability to track you anywhere you go," Reeder says.

"What's important here is choice," he says. Those who want the convenience can opt in; those who see it as an intrusion "simply don't get a smart tag."

The conventional concept of privacy — of simply making sure information isn't disclosed — is much too narrow, Reeder says. Privacy is also "about making sure information is properly authenticated. It's about protecting the accuracy of information even though it may be public, such as [on] a Web site," he says.

Under the terms of the Paperwork Elimination Act, federal agencies must put publicly available information on-

line. Nationwide, states and municipalities are following suit.

"You can go online and find out what someone paid for their house, get property tax information, tax assessment information, see who signed on the loan — it's all public," Neustadt says. While such information historically has been public, locating it has been time-consuming.

"Where once the only people who looked at it were lawyers doing title searches, now it's immediately available to the merely curious," he says. "In some sense, nothing has changed. But that's in theory. Reality is different."

Public Perception at Issue

Agencies and enterprises must also address the public's perception of their ability to interact safely over the Internet, Reeder says.

In the late 1990s, the Social Security Administration (SSA) mounted a Web application that let people request a copy of their personal estimated benefits earning statement, which was then sent by conventional mail. "SSA wasn't doing any more online than you could already do with a postcard," Reeder says. "In fact, it could be said that the paper version had fewer safeguards." But the public perceived it differently and raised an outcry that shut down the application within a few days.

Concern over how an individual's online identity is used and who owns the data has continued to escalate, especially within the past year, says Arabella Hallawell, an analyst at Gartner.

"Every click from the consumer of [digital TV and interactive advertising]

will bring a wealth of demographic data," Hallawell says. Broadcasters will be able to build databases that will be "a lucrative potential source of revenue." And "this will generate interest by regulatory bodies concerned with invasion of privacy" nationally and internationally, she says.

"The U.S. has strong regulations on personal data protection in the public sector but no comprehensive legislation for the private sector," Hallawell says. "As the international community begins to agree on privacy standards, the U.S.'s laissez-faire attitude on private-sector treatment of personal data looks isolationist."

Wireless and mobile services will raise new privacy issues internationally, Jones says. "What happens when you have a database on your [personal digital assistant], and you travel from one jurisdiction to another? Which rules will apply?"

Erroneous or inadvertent transmission of data or its storage location will also test privacy laws, he says.

But such legal, technological and societal issues surrounding privacy may ultimately prove transitory, Neustadt says. How people view privacy "may not be so different from what existed 100 years ago," he says. For example, light telegraphy was used to send messages across France. "As a communication medium, it was very public in the sense that anyone could observe it, so there was always the potential to compromise the privacy of the message," says Neustadt. "People are coming to understand the Internet as a communication medium is much the same." ▀

A Matter Of Policy

Policies that govern how security is implemented will determine the future of privacy more than privacy laws or IT itself, say security vendors, analysts and private and federal watchdog agencies.

Organizations may seek to protect personal data, says Andrew Shen, an analyst at the Electronic Privacy Information Center in Washington, but "without the security, they can't guarantee privacy."

Among privacy-protecting technologies, encryption will lead, says Alan Paller, research director at the SANS Institute in Bethesda, Md. Encryption will be "built into the transmission system and hardware," he says.

And authentication will be crucial, says Clint Kreitner, president and CEO of the nonprofit Center for Internet Security (CIS) in Bethesda, Md. For good authentication, "you need to have something, and you need to know something," he says. Smart cards, which have microprocessors for data exchange and require passwords, may see wider use.

Not so with biometrics, says Paller, because an electronic fingerprint can be illegally captured during transmission and reused.

"Connecting any machine that has information assets exposes those assets to compromise, and there are not enough knowledgeable people to fix the holes. IT vendors ship products with a default of security measures open rather than closed," Kreitner says, because otherwise "most customers are not knowledgeable enough to implement the product without great amounts of support."

To plug that knowledge gap, the CIS is developing specific lists of operating system settings that constitute a baseline level of prudent security practices.

Release of the first set of free baseline security practices will be in early April, for Sun Microsystems Inc.'s Solaris operating system. Lawsuits will follow release of the CIS baseline practices, Paller says, that argue that "minimum security practices were well known, you didn't implement them, and your carelessness took down my company."

Security isn't so much a technology issue as it is "a process issue," says Shen. Even if you know how to implement security, "you can't simply put in new software and let it run," he says. "You have to make sure people are maintaining the system."

Business and legal managers should set security policies based on a collective social, political, legal and business view, says Yogesh Gupta, chief technology officer at Computer Associates International Inc. in Islandia, N.Y. But often they don't, and responsibility is thrust upon IT managers.

— Sami Lais

Network Address Translation

BY PETE LOSHIN

JUST ASK any economist: When a commodity is in short supply, several things happen. The price goes up, rationing begins, and people start scrambling for substitutes. Globally unique Internet addresses, usually called Internet Protocol (IP) addresses, are no exception.

The Internet Engineering Task Force has been aware of the impending depletion of the current address space, called IPv4, for almost a decade. Although the forthcoming IPv6 is still seen as the long-term solution for continued Internet growth, other short-term fixes have been institutionalized in the past several years.

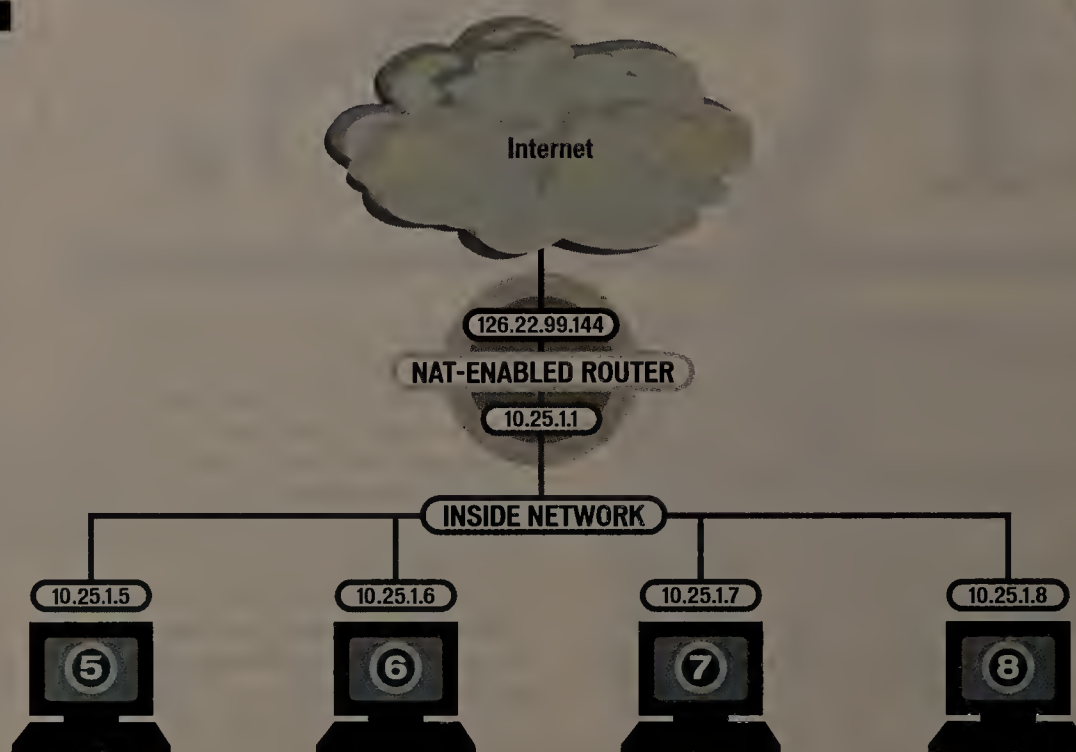
RFC 1631, "The IP Network Address Translator," published in 1994, describes one such fix. In the early days of the Internet, people were urged to apply for globally unique network addresses regardless of whether they ever intended to connect to the global Internet. The idea was to avoid problems when a formerly private network was eventually hooked up to the public Internet.

As the Internet continued to grow exponentially, however, assigning perfectly good network addresses to private networks came to be seen as a waste of valuable virtual real estate. Under the Network Address Translation (NAT) standard, certain IP addresses are set aside for reuse by private networks. As specified in RFC 1597, "Address Allocation for Private Internets," anyone can use addresses in the following ranges: 10.0.0.0 to 10.255.255.255; 172.16.0.0 to 172.31.255.255; and 192.168.0.0 to 192.168.255.255. By convention, routers aren't supposed to forward any packets to these addresses on the Internet.

The simplest NAT device has two network connections: one on the Internet and one on the private network. Hosts within the private network, using their private IP addresses (sometimes also called Network 10 addresses, from the 10.0.0.0 address set aside for

DEFINITION

Network Address Translation (NAT) is the standard method used to map IP addresses from one addressing realm (e.g., a private intranet) to another (e.g., the Internet). NAT allows hosts inside an organization's private intranet to reach hosts transparently in the public realm, without requiring those inside hosts to have a registered (and increasingly scarce) Internet address.



NAT in Action

The NAT-enabled router in this diagram has an IP address of 10.25.1.1 for the inside network and an address of 126.22.99.144 for the outside network. Anytime a host on the inside network (10.25.1.x) makes a request to the Internet, the NAT device will translate the 10.25.1.x to 126.22.99.144. The internal machine can directly access any host on the external network, while from the outside, it appears that all outbound traffic is originating from the router's single IP address.

private use) connect to the Internet by sending packets directly to the NAT device. Unlike normal routers, which merely read the source and destination addresses on each packet before forwarding them to their destinations, NAT devices actually modify the packet headers, changing the private network source address into its own Internet address.

NAT Drawbacks

In using NAT, hosts on the Internet appear to be communicating directly with the NAT device rather than with the actual host inside the private net-

work. Inbound packets are sent to the NAT device's IP address, and the device changes the destination packet header from its own Internet address to the private network address of the true destination host.

The result is that, in theory, a single globally unique IP address can front for hundreds, thousands or even millions, of privately addressed hosts. In practice, however, there are drawbacks. For one thing, many Internet protocols and applications depend on the network being truly end-to-end, with packets forwarded entirely unmodified from the

source to the destination. The IP security architecture, for example, can't work across a NAT device because the original headers, with original IP source addresses, are digitally signed. Change the source address, and the digital signature is no longer valid.

NAT raises administrative challenges as well. Although NAT is a nice solution for an organization, branch or even a department that can't get enough globally unique Internet addresses, it becomes a huge problem when reorganizations, mergers or acquisitions require the consolidation of two or

more private networks. Even when organizational charts are stable, NAT systems can inadvertently be nested, causing routing nightmares.

Beyond the Device

While hosts inside a private network usually connect easily with servers on the outside, hosts on the Internet can't always easily connect to servers within the network. As far as external hosts are concerned, they're communicating directly with a single host — the NAT device itself. The private network is effectively invisible to the outside world, which thinks all traffic from that network is actually traffic originating and terminating at the NAT device.

Network Address Port Translation (NAPT) helps alleviate this problem by translating not just the IP address but also the transport layer port. Thus, an inbound packet addressed to Port 80 (usually used for HTTP packets) on the NAPT device could be translated and passed along to the private network's Web server. Without port translation, the NAT device has no way of knowing which host in the private network to pass such packets to.

NAT is often positioned as a security solution. After all, the private network seems to be hidden from view. However, if an attacker can gain control of the NAT device, the entire network is vulnerable. NAT shouldn't be considered a replacement for a firewall, though simple devices implementing NAT can be useful for protecting small office and home office networks.

Although NAT fans proclaim it as the long-term solution to the IPv4 address shortage, it remains a short-term fix. Ignoring architectural and deployment problems, the IPv4 address space itself is still finite and would soon be overwhelmed if all networks were hidden behind NAT devices. ▀

Loshin is a freelance writer in Arlington, Mass. Reach him at pete@loshin.com.

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Monday, Feb 26

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Content Key for IT Support Service

Breadth of services is what attracts users to Attenza's computer support portal

BY EMILY KAY

EIGHTEEN MONTHS and \$500,000 into the implementation of an IT online help desk support system, Visa International Inc. dumped its project in favor of a mix of customized online support services that includes tutorials, instant tips and other support and training content from Dallas-based Attenza Inc., formerly known as Service911.com Inc.

The original system "took a lot of effort to implement, and it turned out it was kind of an empty shell," says Lloyd Steadman, chief consultant in network integration at the Foster City, Calif.-based credit card company, which has 21,000 financial institution members. "There was no compelling content," he says.

"When it comes to self-help sites, content is everything," says Steadman, and "Attenza has a huge wealth of content."

What the start-up offers Visa and many other large corporate clients is a variety of Web-based computer support services that includes live chat with technicians, e-mail support and video, and text tutorials, says Lawrence Schwartz, founder and CEO of Attenza. And a series of acquisitions, including the purchase of online learning content developers Learnlots.com and BizWorks Inc., has built up Attenza's tutorial library.

The e-support service is available for in-house IT help desk functions or can be repackaged to transparently serve a company's external customers. Through what it calls its Webskin content delivery infrastructure, Attenza claims that it can deploy within days a private-label corporate product that includes a customized look and feel.

That was attractive to Glen Hamilton, business and prod-

uct development vice president at Egghead.com Inc., an online computer hardware and software reseller in Menlo Park, Calif.

Egghead licenses its online support content from Attenza, but customers "know they're coming to us," says Hamilton.

"Our brand name adds some legitimacy to the content."

But Attenza's content was also important, he says. "When we were [deciding whether to] build and maintain our own system, we were pleased to find a company like Attenza, which specializes in [online customer support] content," Hamilton says. Customers at the Egghead Web site can use Attenza's step-by-step instructions or view short videos on



"TODAY, WE do a lot of things other than service," says Lawrence Schwartz, founder and CEO of Attenza.

Attenza Inc.

Location: 1525 North Stemmons Freeway, Dallas, Texas 75207

Telephone: (214) 369-3499

Web: www.service911.com

The technology: Web-based IT help desk support and electronic-learning services

Why it's worth watching: The shortage of technical-support professionals makes outsourcing help desk support attractive.

Company officers:

- Lawrence Schwartz, founder, CEO and chairman
- Mark Thompson, president
- Ray Balestri, chief operating officer

Milestones:

- 1996: Company founded as Fixx MyPC
- 1999: Name changed to Service911.com; focus shifted to Internet-based support
- 2001: Changed name to

Attenza Inc.

Employees: Approximately 100

Burn money: \$33 million from W.R. Harnbrecht and Co., CNET Networks Inc., ZDNet, Ask Jeeves Inc., Richmond Capital Partners LLP and others

Services/pricing: Setup and development fees of \$50,000 to \$100,000, plus usage and monthly maintenance and hosting fees.

Customers: Egghead.com, American Airlines Inc., Exxon Mobil Corp., Mary Kay Inc., Visa International and others

Partners: BancTec Inc., Buy.Com Inc., McAfee.com Corp. and Support.com Inc.

Red flags for IT:

- Service requires a working PC connected to the Internet.
- With no telephone support, the service is a help desk supplement rather than a replacement.

subjects such as how to install memory.

Hamilton says he expects the service to substantially reduce customer support calls, although neither he nor Schwartz could quantify the benefits yet. Hamilton says he sees Web-enabled customer support as "a strategic tool to maintain smooth internal and external operations and remain competitive." So far, Hamilton says, he's happy with the service.

Other e-support providers offer customized service as well, says Tony Adams, an analyst at the IT services group of San Jose-based Dataquest, a unit of Stamford, Conn.-based Gartner Group Inc. Webskin is simply "another name for private branding," he says.

Attenza also offers the Content Analysis and Reporting System (CAARS), which it says enables companies to monitor and analyze service usage by tracking user support histories, chat sessions and e-mail communications. Each user interaction updates the knowledge builder for that client.

Egghead and Visa aren't using CAARS yet, but both say they plan to do so. Steadman says he hopes to use it to identify areas where better staff training is needed.

Attenza has a long list of large corporate customers and has grown 100% annually, says Ana Volpi, an analyst at IDC in Framingham, Mass. She calculates that Attenza's revenue doubled from \$2 million in 1999 to \$4 million last year.

Schwartz says he expects Attenza to show a profit late this year.

Attenza is currently looking for new growth areas. "Today, we do a lot of things other than service," Schwartz says. "We do... e-learning, custom content creation, business intelligence based on user information, all on an outsourced basis."

Schwartz adds that he also hopes to use CAARS to sell Attenza's services to hardware manufacturers, which could use the reports to identify product problems and support issues. ▀

Kay writes about technology as a principal at Choice Communications, an editorial consulting firm in Chelmsford, Mass.

the buzz

STATE OF THE MARKET

Competition By Attrition

E-support is where it's at. The e-support market will explode from \$986 million this year to \$4.1 billion by 2004, predicts Ana Volpi, an analyst at IDC. But that doesn't make the business easy. Competition among third-party support portal vendors is "fierce and growing," she says, and some consolidation has already occurred.

Volpi defines e-support services as Internet destination sites where third parties—not software or hardware vendors—offer technical-support data on software and hardware technologies.

Attenza and its competitors share several attributes, although only a few offer Attenza's broad range of services. For example, not every vendor offers online learning services and customized activity reporting. However, some offer telephone and on-site support options—something Attenza doesn't.

E-support businesses will continue to thrive as long as the shortage of skilled technical workers continues, Volpi says. "Vendors and corporations need to provide technical support 24/7," she says. "People are becoming increasingly mobile and traveling worldwide, and they need tech-support help."

But attracting and retaining skilled technical-support workers is a challenge for support providers as well as their customers, says Tony Adams, an analyst at Dataquest's IT services group. "Many service vendors have gone belly-up because of problems keeping their workforces happy," he says.

And although the market is expanding, it's also crowded, and a consolidation has already begun. In addition to Attenza's recent acquisitions, PCsupport.com Inc. acquired MyHelpdesk Inc. last year, says Adams.

ePeople Inc.

Mountain View, Calif.
www.epeople.com

EPeople is an online exchange that matches technical-support providers with users and offers a Web-based e-support front-end system for corporate users that leverages its network of support providers.

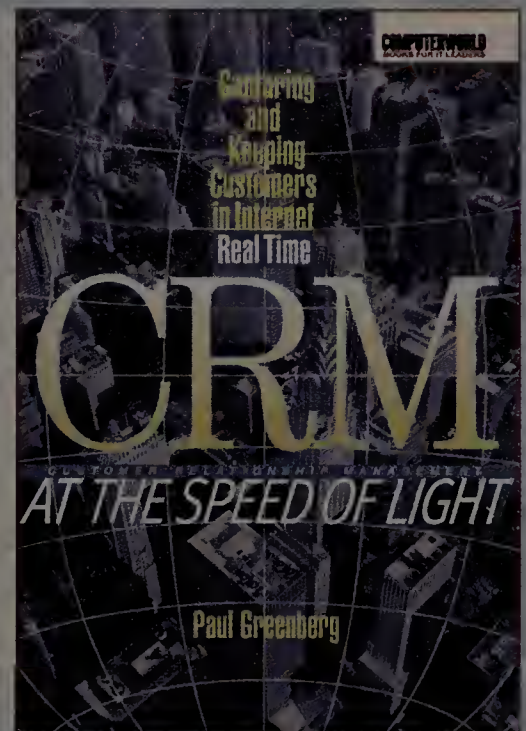
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Norwood, Mass.
www.pcsupport.com

PCsupport.com offers technical support services for hardware and software via live chat, e-mail and the telephone.

—Emily Kay

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WHEN HE WAS a young boy, David Holland used to dream about a magic book. "The pictures on its pages moved, and the people in it talked," he says. "Maybe that influenced me somehow."

Maybe. Today, as a Web application developer at Dark Horse Comics Inc. in Milwaukee, Ore., Holland makes comic books come alive for the thousands of fans who visit the company's six Web sites.

There, they can see exclusive animated serial movies, read online comic books, join discussion groups, download screen savers and games, sign up for free e-mail and order print comics, art, memorabilia and other merchandise related to fantasy and adventure entertainment ranging from *Buffy the Vampire Slayer* to *The Ring of the Nibelung*.

But what the public sees is only part of what Holland is responsible for as a Web application developer. He also creates and maintains internal browser-based applications that support the site and Dark Horse's business, from content management tools for editors to sales reports for accountants to an inventory management system for the IT department.

"It's equally important to make a site that people outside the company can use easily and to satisfy our internal customers' needs for applications," Holland says.

Achieving those goals requires a Web application developer to be proficient in much more than writing code and using technology: The developer must also be part marketer, part business strategist and always focused on the customer.

"You cannot hide from the customer," Holland says. "Our customers know their material, and they'll let us know if we do something wrong."

Team Play

At Dark Horse, Holland is one of nine members of an Internet team that includes developers, designers and specialists such as content editors and Flash multimedia artists. They must all work together with Dark Horse's editorial staff to create successful public sites, so communications skills and teamwork are

important aspects of his job, Holland says.

"I learned to put my own ego aside," he says. "A lot of programmers guard their little trade secrets, but there's no room for that here." Instead, Holland says, the Internet team members share their capabilities with one another, as well as with other Dark Horse employees.

For example, the Dark Horse editors continually create content for the site, from interviews with comic book authors and artists to announcements about upcoming re-

leases. Holland says the Internet team realized it could help editors by building them a tool that enables them to create content, test and review it, and then schedule it for automatic posting on a specific date to a company Web site.

The team also supports Dark Horse's brick-and-mortar retail partners, creating a password-protected area on the company's Web site at which retailers can check on their orders, account status and inventory levels.

In addition, Holland and the Internet team are expected to

get into the mind of the Dark Horse customer so they can create cross links on each page of product content. That lets a fan who's checking out the latest *Star Wars* paperback for sale also see hyperlinks to pages selling original artwork, clothing and more books, which is all part of the company's strategy to make each Web site a marketing tool for the other five Dark Horse sites.

Holland and the Internet team regularly browse through the customer e-mail Dark Horse receives and also see results from minipolls conducted on the company's Web sites. Customers can also pre-order products, and the team can judge from those orders which products are hot.

The Challenge of E-Commerce

While a Web application developer today needs these softer marketing and communication skills, that doesn't mean the technological challenges have diminished, especially if e-commerce is involved.

For example, Holland says providing a real-time inventory function on Dark Horse's sites is a "really, really hard thing to do" because it involves tracking not only Dark Horse's inventory but also items from other suppliers, too.

Another challenge is maintaining server response time on the Web sites. The Dark Horse site itself contains thousands of pages of archival data on virtually every comic book the publisher has issued, and users routinely conduct searches by author, series, issue date and other criteria, returning hundreds of pages of content. "Those are a pretty big load on the servers," Holland explains.

As a Macintosh shop, Dark Horse has been using WebCatalog from Aliso Viejo, Calif.-based Smith Micro Software Inc. for e-commerce. But Holland says his company is researching more open, scalable server options, including Linux and Unix. "We need to make the site handle throughput more quickly," he says.

He's also looking forward to offering more 3-D animation, movies and interactive features once the majority of Dark Horse users have high-speed Digital Subscriber Line or cable modem Internet connections.

JUST THE FACTS

David Holland

Job title: Web application developer

Company and location: Dark Horse Comics Inc., Milwaukee, Ore.

How he got the job: Holland had four years of experience in e-commerce for an online jewelry store and had created interfaces for presenting items on eBay Inc. and for working with database systems. He also designed his own Web site, which served as an example of his skills.

Skills required: Good knowledge of the company's Web and e-commerce tools, fluency in HTML, understanding of information design and structure, the ability to write elegant code and fluency in Perl or PHP server-side scripting languages.

Key soft skills: Communications skills, business savvy, the ability to work as part of a team and the ability to anticipate customer needs.

Training needed: Most of Holland's training was on the job; he taught himself HTML. He says he expects his degree in computer graphics and animation to aid him as the Internet team adds more Flash and other multimedia features to Web sites.

Job and salary potential: Holland says Web technology is "boundless" and he can see himself in this position for a long time. Demand — and pay — for Web application skills remain strong, he says, and developers can expect starting pay to range from \$40,000 to six figures "if you're very skilled." He noted that a colleague in the Bay area is offering Web application developers \$100,000 and more to start.

Career path: Being a Web application developer in a Web-based company provides the opportunity to learn about the overall business, as well as the information systems infrastructure, to a detailed degree. "When I get more comfortable with e-commerce, I might want to move into management," Holland says.

Advice: "Find a company you'll enjoy working for," Holland recommends. Know that employers will review and critique the Web sites you've worked on to get a sense of whether you'll fit in with their firms.

"We have so much content to distribute, so we're really rubbing our hands with anticipation over the prospect of more bandwidth," Holland says.

In the meantime, Holland says, he loves coming to work each day and literally rubbing elbows with the editors, writers and artists who create Dark Horse's products, while he, too, gets to use his creative talents.

"The ability to create something people can use and play with and comment on — even if negatively — is really its own reward," he says. ▀

Watson is a freelance writer in Chicago.

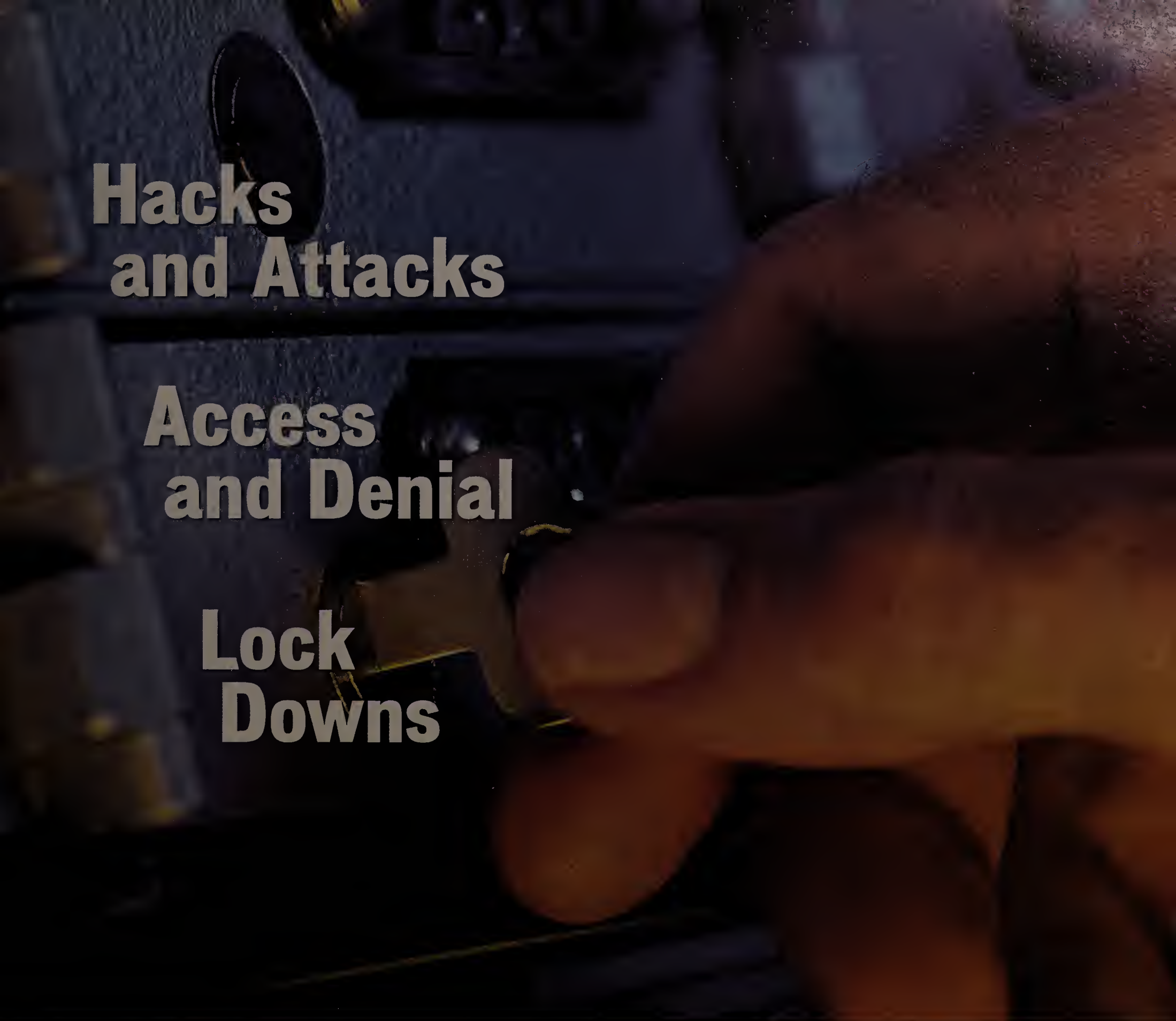
Making Magic On the Web

As a child, David Holland was fascinated with magic. Its influence was far-reaching, impacting his approach to Web application design for Dark Horse Comics.

By Sharon Watson



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Systems Engineer: provide application support for PC and LAN, maintain and improve company web site, administer database, specify architecture systems and implement full life-cycle development of e-business application. Req. BS or equivalent in CS, CIS or MIS with proficiency in C++, HTML and Visual Basic. 8-5, 40hr/wk. \$49,300/yr. Send resume to Orientiques, Inc. 700 Miami Circle NE, Atlanta, GA 30324, fax: 404-467-8101.

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Full time Associate Software Engineer. Responsibilities include: Design, develop and implement leading edge Internet based transaction processing products utilizing state of the art web technology, transaction processing middleware and distributed databases; utilize Visual Basic, UML, WFC, JAVA, ActiveX, DHTML, XML, JavaScript, Active Server Pages, HTTP, SSL, COM, C++, Oracle, SQL, Rational Rose Booch, JDBC, RMI, Domino WebServer, Lotus Notes 4.5, Windows NT and 98 and Unix to lay the foundation and structure the design four tier products; integrate technologies and test products for symmetry; and serve as technical liaison with in-house and client Project Managers. Must have an Associate's Degree or its foreign/educational equivalent in Computer Science, Engineering or related field and three years of progressive experience as a Software Engineer or Systems Analyst, or a Bachelor's Degree or its foreign/educational equivalent in Computer Science, Engineering or related field and one year of progressive experience as a Software Engineer or Systems Analyst. Must have proof of legal authority to work in the United States. Salary: \$67,000/yr and up, commensurate with experience. If interested, submit resume in duplicate to:

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SOFTWARE ENGINEER II

Responsible for the development of major portions of Host or Embedded software. Performs the functional design of familiar product components from specific product requirements with some assistance from more senior Software Engineers. Designs software modules with clearly defined functional requirements without assistance from more senior Software Engineers. Participants in group design activities and provides concrete input to the design of complete product components. Participants in and/or review test cases/test script development for the planned change to the Host or Embedded system. Makes changes to, or creation of, modules or product components that are completely designed. Troubleshoots problems and makes repairs in familiar modules or product components. Changes need only be periodically reviewed by more Senior Software Engineers prior to submission to development packs or development environments used by other Software Engineers. Responsible for general understanding of a GTECH site, its functions (both online and offline), and performs most of these functions with minimal assistance. REQUIREMENTS: B.S. Computer Science, Engineering, Programming or related field plus 2 years experience as Software Engineer II or 2 years experience as Software Engineer II or Computer Programmer. HOURS: 40+/wk. RATE OF PAY: \$52,000/yr. SEND ALL RESUMES TO Ann Cody, Manager, Human Resources, GTECH Corporation, 55 Technology Way, Westborough, MA 01581.

Software Engineer (Atlanta, GA): Responsible for research, design, development, implementation and testing of software products and business system applications, including new technologies and custom application solutions according to customer needs. Will work with other engineers on large-scale projects using Oracle databases, object oriented development techniques, Business Objects OLAP report tool, formal development methodology tools and Powerbuilder 5.6, or 7. Must have Bachelors degree or foreign degree equivalent in Computer Science, Engineering or related field, and two yrs experience as a Software Engineer. Two yrs mentioned experience may have been obtained concurrently and must include (i) 2 yrs experience programming in Powerbuilder 5.6 or 7; (ii) 2 yrs experience using an Oracle database; (iii) 2 yrs experience using object oriented development techniques; (iv) 2 yrs experience using a formal development methodology tool; (v) 2 yrs experience developing Oracle stored procedures with PL/SQL; (vi) 1 yr experience in Business Objects OLAP reporting tool; and (vii) 1 yr experience work on large-scale projects. Must have legal authority to work in the U.S. Send resume to: Staff/Emp. TWC, (REF: SE) 300 Interstate North Parkway, Atlanta, GA 30339.

Senior Consultant-Responsible for a broad range of Business Solutions Group (SAP R/3) consulting activities working with current and prospective clients. Duties include sales negotiations and presentations, development of business plans and presentations; manage development of complex documents; develop and manage engagement workplan and execution; select, modify and use consulting tools; troubleshoot problem areas; prepare and coordinate development of quality deliverables; participate in the development and delivery of local training programs. Requirements include a Bachelor's degree or equivalent in Computer Science, Engineering or related field and three years of experience in the job offered or related field of implementation of manufacturing or business applications; or in the alternative, five years of experience. Applicants must have unrestricted authorization to work in the United States. Salary \$105,000/year. 40 hours/wk. Respond with two copies of resume to Case #20004257, Labor Exchange Office, 19 Staniford St., 1st Fl., Boston, MA 02114.

PROGRAMMER ANALYST Analyze, design, and implement systems. Develop apps. & technical & user-level documentation. Duties include: (i) preparing schematics, data models & prototypes; (ii) determining appropriate new & adapted hardware & software; (iii) determining & design, data base level changes for enhancements of new programs; (iv) creating GUI forms, queries, functions, menus & on-line reports; (v) design, coding & testing individual programs, reports, queries & filters; & (vi) testing & debugging programs. B.S. in Comp. Sci., Engrg., Bus., Physics or Math plus 3 yrs. exp. in position offered or as Software Engr., Systems Analyst, or Software Consultant reqd. Must have working knowledge of Lotus Notes, Lotus Script, Java, JavaScript & HTML languages; SQL Server, Oracle, DB2 or MS Access databases; & Windows operating system. High mobility preferred. 40 hrs/wk, 8 a.m. - 5 p.m., \$70,000/yr. Qualified applicants report/submit resume to: Thomas Dembosky, Mgr., Indiana Job Center, 350 North Fourth St., Indiana, PA 15701. Refer to Job Order No. WEB150447.

COMPUTER PROFESSIONALS MAKE IT YOUR BUSINESS TO GET IN ONE-BUSINESS

CHC is a strategic E-Business solutions and professional services company that is powering a new breed of rapid growth Internet developers. With thirty years of experience, CHC is a global leader in systems integration, migration and innovation, enabling companies to stay ahead of the technological curve.

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We'll provide you with a stimulating supportive environment, attractive salaries and benefits including: Tuition Reimbursement, 401K Savings Plan Company Matched, Life, Health, Dental Plan, On-Going Technical Training and Employee Assistance Program. Please forward your resume to: Tom Culmone, Staffing Manager, Dept 219, COMPUTER HORIZONS CORP. 49 Old Bloomfield Avenue, Mountain Lakes, New Jersey 07046-1495. Call 973-299-4000 or 1-800-321-2421. Fax: 973-331-1632. E-mail: jobs@computerhorizons.com (in MS Word format only, please). An Equal Opportunity Employer M/F.

COMPUTER PROGRAMMER (6 openings). Design and construct MVS mainframe software applications in a CICS/DB2 environment using COBOL II, TSO/ISPF and JCL. Knowledge of VASM and IMS is also required. Must be familiar with Panvalet, FileAid, Xpeditor and SmartTest. Debugging, problem-solving and trouble-shooting skills are mandatory. Candidate must also have knowledge of MicroFocus Workbench, ADW CASE technology, Magic RAD, Btrieve RM and Oracle 7.0. Must be willing to relocate within the U.S. on a project-by-project basis. Must have BS or foreign degree equivalent in Computer Science, Eng./Tech. or related and two (2) years' work experience in the job offered, or two (2) years experience as a Software Engineer, Analyst, or any suitable combination of education, training, and experience, or related. Hrs: 9a-5p, M-F, \$68,848 per yr. Apply to Georgia Dept. of Labor, Job Order #GA6937858, 2943 N. Druid Hills Rd., Atlanta, GA 30329-3909 or the nearest Dept. of Labor Field Service Office.

Computer Systems Hardware Analyst. Responsibilities include analyzing data processing requirements to plan data processing systems; planning layout and installation of new systems; troubleshooting and hardware compatibility testing; providing customer service and technical support to users. Requires a Master's degree in Electrical, Electronic or Computer Engineering. Send resume to: Ms. Alice Wei, PCWarehouse, 6505A Basile Rowe, East Syracuse, New York 13057.

Software Co. in NJ seeks to fill Software Engg Positions - Must have Masters & 2 yrs exp or Bach & 2-5 yrs exp in design, develop & testing s/ware applies using VB, C, C++, Java, ASP, CGI, SQL, Oracle or SQL Server. Respond by resume to HR Dept., Innospire Systems Corp, 267 Amboy Ave, Ste 14A, Metuchen, NJ 08840.

Software developer in Win32 application development sought by electronic parcel delivery company in Newton, MA. Must have B.S. in Comp Sci, Math, Engg, Physics or technology and 3 yrs experience in any software development occupation. Respond by resume to: Halli Salz, HR Mgr ATA Bok, Inc., 29 Crafts St., Suite 300, Newton, MA 02458.

Several computer related positions for large telecom and computer services company in the international airline telecom industry. See www.sita.com for details. Positions in the New York and Atlanta office. Send resume to: Ms. CJ Vanner at SITA INC at 3100 Cumberland Blvd., Suite 200, Atlanta, Georgia 30339.

IT PROFESSIONAL who is capable of leading group of IT engs to support all n/work & servers in NJ, CA offices & China mfr to project teams. Maintains, implants & troubleshoots online Accware 3.2, MS NT Backoffice systems, MS Exchange server, DSN server, IIS server, DHCP server, SQL server & Novell Group Wise Admin, system Backup & Disaster Recovery Plan, Internetworking Dsgn, Router & Switches. Configure, N/work Traffic monitoring, H/ware installation, Info Systems Solutions Research & Eval. Please send resume to HR Dept, Aspect Computer, 21 Worlds Fair Dr, Somerset, NJ 08873. Fax: (732) 563-0662.

PROGRAMMER-ANALYST, FUND ACCOUNTING: Uses software development life cycle methodology in the development of computer programs for a Series Fund Accounting application system in a large financial organization, using Oracle tools in a client server environment. B.S. in Computer Science or Business, plus two years experience in the duties of the job offered. 40 hours per week. Send resume to: Western Reserve Life Assurance Company of Ohio, 570 Carillon Parkway, St. Petersburg, Florida 33716. Attn: Denise Howell, Manager, Client / Server Applications Development.

Statistical Programmer--Biostatistics. Forest Laboratories, Inc. develops, manufactures, and sells both branded and generic forms of ethical pharmaceutical products. Currently our company seeks a Statistical Programmer-Biostatistics. Qualified applicants must have a Master's deg. in Biostatistics or rel. disc. & exp. with Statistical Analysis Software (SAS). Exp may be gained through educ. or emp. Send res. to: Forest Labs, Inc., Attn: Jennifer Schaefer, 909 Third Avenue, New York, NY 10027. Code JS-HL.

Graphic Designer--Designing and coordinating advertisements, corporate logos, and laying out for photographs for corporate and individual clients. Must have Bach deg in arts and knowledge of relevant software. Fluency in Japanese. Respond to HR Dept., Knowex Solutions, Inc., 65 Broadway, 9th Floor, New York, NY 10006.

Web Developer, Sr. Analyze user reqmts, procedures & problems to dev. enabling software systems. Research emerging web technologies, inc. SOAP, XML, CORBA, Enterprise, JavaBeans. Address & analyze detailed steps to design, implmt & test n-tier web portals across platforms. Focus on use of ASP, SOAP, XML, XSL. Prepare tech. documentation of dev. process. BS in Comp Science or equiv. Resume to: MTA Int'l, 50 E. 42 St, #705, NY, NY 10017.

Database Design Analyst: Data analysis/data modeling, customization and enhancement of software applications, system design and development, test plan preparation and quality assurance procedures, user training and documentation in Windows/95/NT, IBM mainframe environments using Visual Basic, Visual C++, CGI, HTML, Active X and Java. MS in Comp Sci. (or equiv). Send resume: HR Dept., ICICI Infotech, Inc., 450 Haritan Center Pkwy., Edison, NJ 08837.

An international consulting firm is seeking: Programmer Analyst. Software Engineers and Database Administrators. Exp with a variety of hardware and software packages. We offer a competitive salary, commensurate rate with exp., plus a comprehensive benefit package, including 401K, health, dental and education assistance/reimbursement. Send resume to: Primesoft, LLC, One Lawson Lane, Burlington, VT 05401. Tel: 802-658-7600/Fax: 802-658-1090 Email: recruiting@primesoftgroup.com

Multiple full time positions open for exp'd Prog/Analysts and S/W Engineers skilled in some of the following: VB, HTML, Java, COM, IIS, ASP, Oracle, Developer 2000, Sybase, Internet/Wireless Technologies, Windows NT, UNIX, database admin, UNIX admin etc. All positions require a BS/MS in CS/Engineering (any branch) or related field (or its foreign equiv. in edu and exp). Highly competitive salary. 60% traveling involved. Send resumes to: InfoSmart Technologies, Inc.: 385 Leatherman Ct. Alpharetta, GA 30005

Computers Systems Analyst sought by Software & Computer Program Company in NYC. Must have Bach in Computer Engineering or Comp. Science and 1 year s/ware exp including Perl+, Java+, Javascript, Unix. Please respond to: CyCom Technologies, 312 5th Avenue, #701, New York, NY 10001.

Senior Implementation Consultant: Will be responsible for performing technical and consulting activities including system design and implementation. Will assist in facilitating customers' implementation activities in the area of foundation building, customer education, and education planning, and project planning and execution. Will execute product implementation tasks, project level implementation strategies, and participate in program activities (C-FIT, Pr/CAP, and others). Will also aid in user learning curve compression, mentor implementation associations, and document methodologies and case studies. Job is in Boca Raton, Florida. Requires a Bachelor's degree in Computer Science, Electrical/Mechanical Engineering, Physics, Mathematics or equivalent; and 2 yrs. in the job offered OR 2 yrs. experience in CAD/CAM consulting or development. Candidate must also possess demonstrated expertise supporting Product Data Management (PDM) products. Salary: \$59,950/year; M-F 9a-m-5pm; 40 Hrs. Per Week. Send Resume to Workforce Program Support/A.L.C. Unit, P.O. Box 10869, Tallahassee, Florida 32302-0869; Attn: EH, FL-2150577.

Assoc. Object Technology Consultant--provide technical consultancy to clients on/off site. Determine customer requirements. Participate in full lifecycle of software development. Provide training courses and seminars. Work with client through all phases of development. BS or equiv in Computer Science or related field, plus 2 yrs exp in OO Technology. Send resumes to: Doreen Nichols, HR Manager, ICNA Technologies, 200 West Street, Waltham, MA 0245.

Database Administrator for automotive component manufacturer to develop and implement procedures for UNIX and Oracle database installations and upgrades. Requires minimum three years experience developing and implementing procedures for UNIX installation configurations and upgrades, including developing shell scripts in Digital UNIX, and in performing system internal testing and disaster recovery planning. Requires B.S. in Electronics Engineering or equivalent. Send resume to: H.R., McCord Winn Textron, 645 Harvey Road, Manchester, New Hampshire 03103.

Engineers/Programmers/Technical Support personnel needed. Boston, MA based company has several senior and entry level positions available. Qualified candidates must possess a BS/MS and/or relevant work experience. Work with some of the following: C, C++, Pascal, Embedded Systems and Motorola Assembly. Fax resumes to P&E Microcomputer Systems at (617) 353-9205, or email to resumes@pemicro.com.

INFORMATION TECHNOLOGY DIRECTOR: Oversees integration, networking and web accessibility of large multi-state information systems through data warehouse management, including document imaging. Travels to network sites around U.S. Must have B.S. in Computer Science (or equivalent) and two years experience in job offered. \$70-90,000/year; 50+ hr/wk, Monday - Friday; "on call" for system failures. Send resume to Attn: Debra Guild Human Resources, 21st Century Oncology, Inc., 2234 Colonial Blvd., Ft. Myers, Florida 33907.

Software maintenance Programmer-40hrs/wk, 9:00 a.m.-5:00 p.m., \$47,000/yr. Provide customer maintenance and support, customization and implementations using VB Script; technical support to VARS. Must possess a Bachelor's degree in Engineering or the equivalent and two (2) years experience in the job offered or two (2) years experience in a related occupation (Technical Designer, Design Engineer, Engineer or equiv.) Please send 2 resumes to: Case #20002520, Labor Exchange Office, 19 Staniford St. 1st Fl., Boston, MA 02114.

Programmer-Analyst. 2 needed immed. to develop, code, & implement info. systems and integrate with databases. Know Win NT, HTML, UNIX, SQL. \$75K/yr. Bachelor's and 2 yrs. exp. in any IT field. Res. to GST, 1005-E Village Greenway, Cary, NC 27511 or email gstusa@hotmail.com

WEB DEVELOPERS (NJ): Develop and implement high volume Web-based application using ASP, VB 6, COM+, SQL 7.0, Java Script and Perl. BS in computer science. Good pay plus good benefit. Send resume to HR, Vanguard InterActive, Inc., 140 Sylvan Avenue, Englewood Cliffs, NJ 07632, or email lisa@vanguardinteractive.com

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LEVEL 8 SYSTEMS INC., an industry leader in middleware & large-scale business application development, seeks: Software Developers, Product Specialists and Application Support Engineers for the development, testing and technical support of products and services. Positions may require travel throughout North America 90% of the time. Competitive salary based on experience. Positions located in Cary, NC, New York, NY and Dulles, VA. Apply by sending resume to Kathy Burnet, HR Department, Level 8 Systems, Inc., 8000 Regency Parkway, Cary, NC 27511.

Computer Professionals

Capital Technologies, a Pennsylvania based company with branch offices in NJ, IL, OH, etc has multiple openings for both entry and experienced Programmer/System Analysts, Software/Project Engineers, DBA with any of the following skills: Informix Unix, SOL/SOL Server, GUI, DB2, CICS, COBOL, C/C++, Oracle or Sybase, Powerbuilder, etc. Req. MS or BS with exp. Attractive salary with excellent benefits. Send resumes to: ATT: Ms. Elizabeth Grant 994 Old Eagle School Road, Ste 1010, Wayne, PA 19087 or 709 Stokes Road, Medford, NJ 08055.

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Database Administrator - Engineering, maintain Progress & Oracle databases, including monitoring, operations & capacity; plan upgrades, performance tuning, development & quality assurance of database code. Required: Bachelor of Science or foreign degree equivalent in Computer Sc., Eng. or Math; with 3 yrs work exp. for internet service provider or 3 yrs as UNIX operating system administrator. Prior work must include 2 yrs experience with Progress or Oracle databases, Cisco routers, TCP/IP, and UNIX operating system using Solaris and Linux. Respond to: Laurie Gardner, EarthLink, Inc., 1430 W. Peachtree Street, NW #400, Atlanta, GA 30309

SOFTWARE ENGINEER

Software engineer to design, develop and test computer programs for business applications; analyze software requirements to determine feasibility of design; direct software system testing procedures using expertise in Oracle Forms 4.5, Oracle 7.3 and Developer/2000. Requirements: Bachelor's Degree or equivalent in Computer Science or related field and two years experience as a software engineer or computer programmer, knowledge of Oracle Forms 4.5, Oracle 7.3 and Developer/2000. Salary: \$66,000/year. Working Conditions: 8:00 A.M. to 5:00 P.M., 40 hours/week, involves extensive travel and frequent relocation. Apply: Mr. James J. Mackin, Beaver Falls Job Center, 2103 Ninth Avenue, Beaver Falls, PA 15010, Job No. WEB150861.

SOFTWARE ENGINEER

Software engineer to design, develop and test computer programs for business applications; analyze software requirements to determine feasibility of design; direct software system testing procedures using expertise in Cold Fusion, JavaScript and SQL Server. Requirements: Bachelor's Degree or equivalent in Computer Science or related field and two years experience as a software engineer or computer programmer, knowledge of Cold Fusion, JavaScript and SQL Server. Salary: \$66,000/year. Working Conditions: 8:00 A.M. to 5:00 P.M., 40 hours/week, involves extensive travel and frequent relocation. Apply: Ms. Mary Pat Curran, McKeesport/Allegheny Co. Careerlink, 345 Fifth Ave., McKeesport, PA 15132, Job No. WEB150866.

Senior Consultant. Design, development & implementation of software for management information systems. Application & technical consulting for SAP business modules. Technical environment: SAP R/3; ABAP/4; MVS/ESA; COBOL; CICS; DB2; JCL. MS in Comp. Sci.* + 6 mos exp in job offered or as Consultant req'd. (*MS in any engineering field + 6 mos exp in software development acceptable in lieu of MS in Comp. Sci.) Previous exp must include: SAP R/3, ABAP/4, COBOL. Relocation to various & unanticipated worksites throughout U.S. 40 hrs/wk, 9am-5pm, \$80,000/yr. Apply at the Texas Workforce Commission, Houston, Texas, or send resume to 1117 Trinity, Room 424T, Austin, Texas 78701, JO# TX1104918. Ad paid by an Equal Opportunity Employer.

Programmer (Atlanta, GA): Design, develop computer system & programs on mid-range UNIX platform using C, Pro*C, SQL & Oracle Database. Also design, implement & develop new features & functionality for products & services. Req. BS in CS plus 6 mon. exp. w/ SQL, Oracle Database & C. Resume to: Sr. Director, Kathy Beatty, Equifax, Inc. 1525 Windward Concourse, Alpharetta, GA 30005.

SOFTWARE SUPPORT FOR STRATEGY CONSULTING

Decision Architects, a Monitor Group Company, providing customized software solutions in support of strategy consulting, has an immediate need to fill a range of software, database and IT positions in the Boston area.

The following positions all require a Bachelor's degree (or equivalent) in Computer Science, MIS, Business Administration, or similarly relevant field, and 2-6 years' relevant experience to include the requirements described below:

PROGRAMMER - ANALYST and DATA BASE DESIGN ANALYST POSITIONS

• **Application Development Analyst (Business Systems)** with experience building software-based business analysis models, and a functional understanding of financial accounting.

• **Data Base Design/ Application Consultant** with experience in software development, data base admin / design, performance-tuning, Oracle Lite and Express, and a functional understanding of financial accounting.

Starting salaries range from \$72,000 to \$90,000 per year, together with two weeks' paid vacation, medical, dental, life and disability insurances, and other industry-competitive benefits.

Please mail or fax resume to: Ms. Kathleen Jung, Recruiter, Decision Architects, 2 Canal Park, Cambridge, MA 02141. Fax: (617) 761-3660 E-mail: Hire_Me@Decisionarc.Com Visit: www.Decisionarc.Com

Decision Architects, a subsidiary of the Monitor Company Group, is an equal opportunity employer.

Software Engineer

Database Administrator to do logical and physical design of Oracle database; Code test and implement Oracle scripts applying knowledge of Database Management Systems; Calculate optimum values for Oracle database parameters; performance tune Oracle databases; Model Oracle database security; manage backup and recovery of Oracle databases; make changes to Oracle database applications using expertise in Oracle database administration which includes logical design, physical design, performance tuning, backup and recovery, coding of scripts, knowledge of Oracle 7.3, SQL *DBA, Pro *C (tools) and PL/SOL (Language). Requirements: Bachelor's Degree in Computer Science or related field and five years experience as a software engineer or database administrator, expertise in Oracle database administration which includes logical design, physical design, performance tuning, backup and recovery, coding of scripts, knowledge of Oracle 7.3, SQL *DBA, Pro *C (tools) and PL/SOL (Language). Salary: \$72,000/year. Working Conditions: 8:00 A.M. to 5:00 P.M., 40 hours/week, involves extensive travel and relocation. Apply: Mr. Anthony Gebicki, Westmoreland County CareerLink, 300 East Hillis Street, Youngwood, PA 15697-1808, Job No. WEB150872.

SR. SAP PROGRAMMER - W. R. Grace & Co. is seeking a Senior SAP Programmer Analyst at its facilities in Columbia, Maryland, to configure SAP software and develop solutions using SAP ABAP/4 and Oracle programs. BSc. & extensive Systems Analyst w/SAP experience req'd. Salary commensurate with experience. When applying for this position, please forward resume to W. R. Grace & Co., Attn: April Mason, Manager, Int'l Assignments, 7500 Grace Drive, Columbia, Maryland 21044.

STAFF SCIENTIST I (Atlanta, GA) to develop and implement advanced mathematical and statistical algorithms, including time-series analysis/forecasting, single or multi-echelon replenishment, large-scale simulations, neural networks, genetic algorithms, distance vector clustering, pattern detection, and data characterization; Design, implement and analyze large-scale application software systems in a client server environment; Develop technologies, strategies and validation techniques; Test data and create methodologies to support model generation for computationally intelligent software components; Lead a team and establish work plan under limited supervision. Require: Master's degree in Applied Mathematics, Computer Science, Electrical Engineering, or a closely related field. Must have a demonstrated ability to perform stated duties gained through previous work experience / academic coursework and projects. Salary: \$68,000 per year. Apply on-line at www.retek.com/apply. Be sure to include "CW0201" as the source code.

Software Analyst II. Duties: Perform product design for single product modules & sub-systems. Code, test & debug assigned modules in C, C++ & Delphi on UNIX oper. system in accord. with design specs. Perform unit testing & integration testing for functionality & limits. Perform bug verification, release testing & beta support for assigned products. Provide customer support as necessary to resolve tech. issues. Requires: B.S. in Comp. or Info. Sci., Eng. or related field and 2 yrs. exp. in the job offered or 2 yrs. exp. as a Software Eng. will accept any comb. of educ. + exp. equiv. to a bach.'s degree. Exp., which may have been obtained concurrently, must incl.: 2 yrs. exp. performing unit testing, integration testing & bug verification & 2 yrs. exp. using C and C++ on a UNIX oper. system. EOE. 40 hrs./wk.; 8:00 a.m. to 5:00 p.m. Salary: \$69,000/yr. Send resume (no calls) to: Cathy Dyer, DataTrac Corporation, 200 Hannover Park Rd., Ste 200, Atlanta, GA 30350. Must have legal auth. to work in U.S.

Director, Infrastructure - Phelps Dodge is seeking a Director, Infrastructure for its Global headquarters in Miami, Florida, responsible for overall IT infrastructure of Wire & Cable group. Direct computer operations, WAN, and LAN. At least 5 years exp. w/BPCS transaction system, global customer service delivery, including Asian and South American entities, VPN and MetaFrame technologies. Demonstration of successful preparation & mgmt of \$10 million+ IT budget w/in manufacturing company environment. Salary commensurate with experience. In return for your professional abilities, we offer an attractive compensation and benefits package. For immediate consideration, please send or fax a cover letter along with your resume and salary history to Phelps Dodge Wire & Cable Group, Attn: Don Powell, Human Resources, 806 Douglas Road, Suite 800, Coral Gables, FL 33134, No phone calls please. Equal Opportunity Employer.

SOFTWARE ENGINEER

Software engineer to design, develop and test computer programs for business applications; analyze software requirements to determine feasibility of design; direct software system testing procedures using expertise in Java, JavaScript, C++ and Informix. Requirements: Bachelor's Degree or equivalent in Computer Science or related field and two years experience as a software engineer or computer programmer, knowledge of Java, JavaScript, C++ and Informix. Salary: \$66,000/year. Working Conditions: 8:00 A.M. to 5:00 P.M., 40 hours/week, involves extensive travel and frequent relocation. Apply: Ms. Sue Notarnicola, Fayette County Team PA Careerlink, 32 Iowa Street, Uniontown, PA 15401, Job No. WEB150856.

Computer

Software Engineer

Software Engineer (Bethesda, MD)- you will research, design and develop computer software systems, applying principles and techniques of computer science, engineering and mathematical analysis and carry out other software engineering duties. Required: Master's degree in Computer Science or Information Systems or MIS or Engineering (any type) or Science or Mathematics. 40 hours per week, from 9:00 a.m. to 5:00 p.m. Salary commensurate with experience. Please send cover letter and resume to: ADP IMS, 10401 Fernwood Road, Suite 280, Bethesda, MS 20817, or fax to: (301) 571-6047, or email to: adp@hiresystems.com. No phone calls, please. EOE

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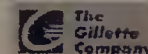
Consultant. Design, develop, implement & test software for management information systems. Configuration of SAP modules. Development of reports & programs. Creation of new database applications & database performance tuning & optimization. Technical environment: SAP; ABAP/4; UNIX; Windows NT; Oracle; Informix. MS in Comp. Sci.* + 1 yr exp in job offered or as SAP Consultant req'd. (*MS in any engineering field + 1 yr exp in software development acceptable in lieu of MS in Comp. Sci.) Previous exp must include: UNIX, Oracle, SAP. Must be willing to relocate to various unanticipated worksites throughout US approx. every 6 mos. 40 hrs/wk, 9am-5pm, \$80,000/yr. Apply at the Texas Workforce Commission, Houston, Texas, or send resume to 1117 Trinity, Room 424T, Austin, Texas 78701, JO#TX1101906. Ad paid by an Equal Opportunity Employer.

Consultant. Convert and re-engineer software applications on IBM mainframe and client/server, including Year 2000 and Euro-currency conversions. Analyze existing applications. Perform coding and testing. Develop Year 2000 conversion tools. Tools: COBOL; CICS; VSAM; TSO/ISPF; DB2; JCL; Visual Basic; Access. Bachelors degree in Computer Science* + 1 year experience in job offered or as a Software Developer required. Prior experience must include: developing Year 2000 conversion tools; COBOL; Visual Basic. (* In lieu of computer science, will accept degree in any engineering field). 40hrs/wk. 9am-5pm. \$50,000/yr. Applicants must show proof of legal authority to work in the US. Send 2 copies of resume & cover letter to Illinois Dept. of Employment Security, 401 S. State St.-7 North, Chicago, IL 60605. Attn: Brenda Kelly. Ref# V-IL-24597-K. Employer Paid Ad. No calls.

Consultant. Design, develop, implement & test software for management information systems. Administration of SAP modules. Development of reports & programs. Creation of new database applications & database reorganization. Technical environment: SAP; BASIS; ABAP/4; UNIX scripts; Oracle. MS in Comp. Sci.* + 1 yr exp in job offered or as Systems Analyst req'd. (*MS in any engineering field + 1 yr exp in software development acceptable in lieu of MS in Comp. Sci.) Previous exp must include: UNIX, Oracle, SAP. Must be willing to relocate to various unanticipated worksites throughout US approx. every 6 mos. 40 hrs/wk, 9am-5pm, \$80,000/yr. Apply at the Texas Workforce Commission, Houston, Texas, or send resume to 1117 Trinity, Room 424T, Austin, Texas 78701, JO#TX1101910. Ad paid by an Equal Opportunity Employer.

INFORMATION

TECHNOLOGY OPPORTUNITIES



The Gillette Company is the world leader in more than a dozen consumer product categories. Global World Class operations are increasingly dependent on Information Technology. Exciting opportunities exist in global business process integration initiatives. We are currently seeking the following highly qualified professionals to join the Gillette IT team in the Boston area.

The following positions (unless otherwise noted) all require a Bachelor's degree (or equivalent) in Computer Science, MIS, Business Admin., or similarly relevant field, and 3-5 years relevant experience to include the requirements described below.

- **Senior Staff Programmer Analyst** with 5 years business systems programming experience, 3 years of which involved SAP ABAP development, with design and OA expertise, and SOL/relational databases. [Job Code #: IMSP-DL-1CP]
- **(SAP) Staff Basis Administrator** with 3 years IT experience defining requirements and maintaining SAP Basis infrastructure, with SAP remote printing, HP-UX, and EMC hardware/software. [Job Code #: IMSP-DL-100008CP]
- **Senior Telecommunications Analyst** with Associate's degree, 3 years experience in design and implementation of multi-carrier global networks using Cisco hardware and software. [Job Code #: IMSP-DR]

Starting salaries range from \$53,700 to \$96,400 per year, together with paid vacation, medical, dental, life and disability insurances, and other industry-competitive benefits.

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IT Careers in Financial Services

Just as the InfoWorld Test Center has shifted away from reviewing boxes and tools to technology in general, so too has the world of financial services information technology. The technology is what brings the expertise of brokers, bankers and analysts to their customers, as well as sharing knowledge throughout these firms. The result is that most financial services firms are looking for people with experience in large-scale implementation — identifying how varied technologies can work together behind the scenes of what web-enabled technology is providing to customers and suppliers.

Kemper Technology Services — Long Grove, IL

Jack Scott, president of Kemper Technology Services, has been working the financial services/technology angle for more than three decades. "One of our key challenges for the future is how to distribute ourselves and our knowledge to match our user community, and that takes on a number of dimensions," says Scott.

The result is a need for technology employees who have deep technical skills and who can work closely with the distributed business activity. "To respond to this environment, we have a dual path for technologists — one that is linked more closely to the business and the other as senior level, deep technologists," Scott explains. "This dual track recognizes the increasing complexity of the systems we're developing."

The deep technology positions are mainly available in Long Grove. "These positions range from entry-level to senior architects, application architects and project managers. We also have positions available in Jacksonville and Jersey City. These positions will consist of developers and business analysts and will assist us in aligning more closely with business offices across the country," says Scott.

Kemper currently is retooling systems for web delivery to include new business management tools, large-volume delivery capability and data management. Web sphere and Java are being used as the basis for much of the development. "The data management aspect includes incorporating different data models and implementation of middleware that will provide access and consistency across a heterogeneous environment," Scott says.

"Kemper Technology Services provides diversity of work for employees and includes a commitment to technology. We also offer excellent benefits and an IT-focused employee development program," says Scott. "Kemper is an organization with an exceptional reputation and a long history of success in a stable environment."

OpenLink Financial, Inc. — Mitchel Field, NY

When financial services and energy marketers look for technology, they often turn to OpenLink, one of

the industry leaders in trading and risk management systems. "Our software handles the entire trade life-cycle management process," explains Diane Montaruli, vice president of human resources. "It offers extensive cross market capabilities, and provides our customers with a flexible, scalable and best-of-fit solution."

OpenLink's lead products are Endur for energy markets, and Findur for financial markets. With a diverse set of top-tier clients worldwide, OpenLink services mega utilities, energy marketers, central banks, settlement banks and trading houses. "Our clients represent the top of the spectrum in each of the markets we serve and include such names as Dynegy, KeyCorp, Coral and Bank for International Settlements," says Montaruli.

OpenLink's corporate headquarters is located in Mitchel Field, just outside New York City, and has regional offices in Houston, Texas and London. Project management, client support and technical development positions are available at all three locations. The business is seeking IT professionals with C/C++ language experience, Java, Web Logic, EJB and database skills. "Ideally, we are seeking employees who have a balance of technical and marketplace experience," says Montaruli. "That's important for our product development and for the clients we support."

"Here you'll be a software developer for the markets you hear about every day in the news — energy, commodities, foreign exchanges, derivatives. You will be at the pulse of what is going on in the world today, as our clients are constantly pushing us to be on the leading edge," adds Montaruli. "We're a stable company whose aggressive growth has been based on sales, not projections."

PricewaterhouseCoopers — New York, NY

PricewaterhouseCoopers Technical Consulting Group performs two key functions for the financial services industry. First, it web enables internal and external relationships through technology. "For instance, financial firms may be looking for information and data to provide to customers and to share throughout the firm," says Nicholas Tsororos,

associate director of recruiting for emerging and integrated technology efforts. "We create the underlying architecture that makes this possible."

Then, PricewaterhouseCoopers' team ties information, customers and employees back together through customer relationship management, ERP, human capital, technology management, and data warehousing systems to help customers gain full advantage of the systems they have in place. "We provide these capabilities to most of the major financial services — insurance, investment, capital management, commercial banking and brokerage firms," adds Tsororos.

"The combination of skills needed today do differ from what we needed just a year ago," Tsororos says. "We need people with experience in building systems, who have dealt with the end-users and been there and done that on some of the large-scale systems and new technologies — and know how to tie it all together." While many of the PricewaterhouseCoopers projects are based on UNIX, the IT teams also work with most of the major platforms. "We need strong knowledge of technology and business and people who can lead small or large endeavors while also doing the tasks."

In addition to a full-scale employee development process and online education, PricewaterhouseCoopers assigns a coach for every employee. The idea is to help employees with their current assignments, but also to develop skills and experiences needed to gravitate their careers and the service the firm provides to clients. "We have a framework that allows you to work in any of six areas or a multitude of the six," says Tsororos. "I usually advise people to work in two or three at least to provide some balance."

IT careers

For more job opportunities with financial services firms, turn to the pages of ITcareers.

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ARCHBOLD MEDICAL CENTER	8	EVT INC.	8	ENTERPRISE		KEYNOTE SYSTEMS INC.	10,42	PCSUPPORT.COM INC.	62	TACTICAL STRATEGY GROUP INC.	32
ARCOROA SOLUTIONS LTO	40	F-SECURE CORP.	54	ENTERPRISE		KMART CORP.	10,47	PCTEL INC.	10	TERRADON	
ARIBA INC.	46	F5 NETWORKS INC.	10	ENTERPRISE		KNOSYS INC.	44	PENN NATIONAL INSURANCE	18	TECHNICAL COMMUNICATIONS GROUP LLC	1
ARINC INC.	1	FEDERAL TRADE COMMISSION	36	ENTERPRISE		LABMORGAN	40	PEOPLESOFT INC.	74	THE DUN & BRADSTREET CORP.	12
ARTHUR ANDERSEN LLP	12	FEDEX CORP.	32	ENTERPRISE		LEVI STRAUSS & CO.	47,58	PEPSICO INC.	48	THE HERTZ CORP.	10
ASK JEEVES INC.	82	FMC CORP.	52	ENTERPRISE		LM ERICSSON TELEPHONE CO.	14	PERFORM SA.	24	THE HOME DEPOT INC.	36
ASTUTE INC.	6	FORO MOTOR CO.	8,14,38	ENTERPRISE		LOCKHEED MARTIN CORP.	32,48	PETSMART INC.	36	THE LIMITED INC.	42
AT&T CORP.	10	FORRESTER RESEARCH INC.	6,14	ENTERPRISE		LOGILITY INC.	47	PHARMAVITE CORP.	47	THE RECRUITERS GROUP INC.	10
ATTENZA INC.	82	FOUNORY NETWORKS INC.	28	ENTERPRISE		LUCENT TECHNOLOGIES INC.	10,24	PILOT NETWORK SERVICES INC.	1	THE YANKEE GROUP	8,10,24,52
AVENTAIL CORP.	52	FREEORIVE INC.	53	ENTERPRISE		MARY KAY INC.	62	PRESTON GATES ELLIS		TOSHIBA AMERICA	
BAAN CO	74	FTO.COM INC.	10	ENTERPRISE		MCAFFEE.COM CORP.	62,73	& ROUELAS MEEDS LLP	7	INFORMATION SYSTEMS INC.	56
BANCTEC INC.	62	GALILEO INTERNATIONAL INC.	16	ENTERPRISE		MERCATOR SOFTWARE INC.	24	PRICEWATERHOUSECOOPERS	40	TRANSACTIONAL PLUS INC.	40
BMC SOFTWARE INC.	24	GARTNER GROUP INC.	1,14,16,18,32,40,47,52,58,62	ENTERPRISE		MERCURY INTERACTIVE CORP.	48	PROCTER & GAMBLE CO.	8,47	TRANSAMERICA CORP.	48
BOEING CO	32	GENERAL ELECTRIC CO.	74	ENTERPRISE		META HEALTH INC.	8	PROFLOWERS.COM	10	TRIPWIRE INC.	54
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BROADWING INC.	8	GIGA INFORMATION GROUP INC.	1,10,24	ENTERPRISE		MICRON TECHNOLOGY INC.	44	INTERNATIONAL INC.	28	U.S. DEPARTMENT OF COMMERCE	12
BUOGET RENT A CAR CORP.	10	GLOBE RANGER CORP.	47	ENTERPRISE		MICROSOFT CORP.	17,10,16,18,24,29,52,73	RAYTHEON CO.	32	U.S. DEPARTMENT OF ENERGY	39
BUY.COM INC.	48,82	GUARDENT INC.	48	ENTERPRISE		MOBILESTAR NETWORK CORP.	1	REALRATES.COM	46	U.S. DEPARTMENT OF JUSTICE	7
CABLETRON SYSTEMS INC.	28	HACKETT		ENTERPRISE		MORRISON & FOERSTER LLP	12	REEBOK INTERNATIONAL LTO	36	UUNET TECHNOLOGIES INC.	28
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CENTER FOR INTERNET SECURITY	59	HERMAN MILLER INC.	32	ENTERPRISE		NAPSTER INC.	7	RIPTech INC.	1	VERIZON WIRELESS INC.	10
CHARLES SCHWAB & CO	32	HEWLETT-PACKARD CO.	12,14,24,44,56	ENTERPRISE		NASA	8	RIVERSOFT TECHNOLOGIES LTO	24	VISA INTERNATIONAL INC.	82
CHECK POINT		HOTWIRE	10	ENTERPRISE		NASDAQ STOCK MARKET INC.	32	ROYAL CARIBBEAN CRUISES LTD.	18	W.R. HAMBRECHT AND CO.	62
SOFTWARE TECHNOLOGIES INC.	48	HR PRIVACY SOLUTIONS	12	ENTERPRISE		NATIONAL ENERGY RESEARCH		RSA SECURITY INC.	54	WAL-MART STORES INC.	12
		HUTCHISON WHAMPOA LTO	6	ENTERPRISE		SCIENTIFIC COMPUTING CENTER	39	S1 CORP.	40	WEBWASHER.COM AO	52
		HYPOVEREINSBANK	52	ENTERPRISE		NATIONWIDE INSURANCE COS	48	SANS INSTITUTE	59	WHERE.NET CORP.	14
		I2 TECHNOLOGIES INC.	47	ENTERPRISE		NESTLE SA	47	SAP AG	24,36,47,52,74	WIZMO INC.	52
		IBM	6,10,14,18,32	ENTERPRISE		NETIO CORP.	18	SAP AMERICA INC.	24,36	WORLD.COM INC.	10,28
		IOC	1,7,16,18,29,36,62	ENTERPRISE		NETSCAPE COMMUNICATIONS CORP.	52	SAS INSTITUTE INC.	24	XMLSOLUTIONS CORP.	48
		IDEFENSE INTELLIGENCE SERVICES	59	ENTERPRISE		NETWORK FLIGHT RECORDER INC.	54	SEARS, ROEBUCK AND CO	18	YAHOO INC.	29
		IOENTRUS LLC	40	ENTERPRISE		NETWORK SECURITY WIZARDS INC.	54	SEGUE SOFTWARE INC.	48	ZONET	62

Spread of Kournikova Virus Highlights Security Lapses

Unscathed users describe preventive measures taken to filter out worm

BY JENNIFER DISABATINO

SECURITY SOFTWARE vendors and other experts are warning users of the dire consequences of viruses, such as the worm disguised as a photo of Russian tennis star Anna Kournikova that was launched last week.

Servers across corporate America were bombarded with the Visual Basic Script (VBS) worm built from a crude tool kit. That the worm spread as swiftly as it did shows that companies have a long way to go to improve lax security in their infrastructure and among their users, said observers.

"I didn't see anything new about this one. People should have had filters in place to prevent this," said Mark Amos, manager of information security at Owens Corning in Toledo, Ohio.

The worm, which did no damage, was allegedly written by a 20-year-old Dutch man who turned himself in to police. In a statement to authorities, the suspect said he "made a virus to prove how simple it was to make [one] and how vulnerable computers are."

A Patch Does Exist

Once the attachment was opened, the worm worked its way through the address books of Microsoft Outlook users. Yet, eight months ago, Microsoft Corp. put out a patch for its Outlook e-mail software in response to similar problems with the "I Love You" virus. That patch would have prevented users from being infected with the Kournikova worm, said Vincent Gullotto, the director of McAfee.com Corp.'s McAfee Anti-Virus Emergency Response Team laboratory in Beaverton, Ore.

While those hardest hit aren't talking about the virus and its damage to their corporate systems, a few security managers have shared their experiences with the Kournikova worm, or VBS/SST.

Paul L. Schmehl, supervisor of support services at the University of Texas at Dallas, said constant education of his staffers has led them to a point where he trusts them to recognize the potential threat in unsolicited attachments.

"Our experience has shown that our users do use sound judgment regarding attachments," he said. "However, the onslaught of viruses that use stealth, encryption, multiple attachment file names, subject lines and body text makes it more hassle than it's worth to keep our users informed of the details of every virus. So we now bounce them at the gateway mail server, and they never enter our environment."

Among other things, Schmehl filters .vbs files. Amos said he deploys similar multiple lines of defense at Owens Corning, and that prevented infection this time.

Owens Corning uses several layers of security that keep end users from even seeing an attachment, Amos said. The company uses a filter service outside the firewall, antivirus software at the firewall, filters internally between servers and on the antivirus software on the desktops. Users, with some exceptions, can't receive attachments, said Amos. "We didn't have any problem," he said.

Blocking suspect attachments is no silver bullet either, said Matthew Pemble, a consultant at the Preston Technology Management Centre in England, since files can be saved with any extension.

Continued from page 1

Server Probes

in the Berkeley Internet Name Domain (BIND) server from the Redwood City, Calif.-based Internet Software Consortium.

In fact, many companies don't even know they are being scanned or if their networks have been compromised, security specialists said.

Meanwhile, other experts warned that hackers with track records of developing sophisticated automated hacking tools are already planning to cross-breed Internet worms, such as the recent Ramen worm, with other DNS exploits, thus creating the potential for widespread network problems.

"There are a couple of worms on the horizon that will probably be the next breaking story," said Amit Yoran, CEO of Riptech Inc., a network security firm in Alexandria, Va. "In literally a matter of hours, a very large number of zombie hosts can be created for planned [distributed denial-of-service] attacks, multiple hopping points to cover your tracks and other activities."

IT managers across the na-

tion also are reporting rise in DNS-related probes, with many attributing the increase to the Jan. 29 public announcement of vulnerabilities in BIND.

Keith Morgan, a network security specialist at Terradon Communications Group LLC, a Nitro, W. Va.-based Internet software developer for Fortune 500 firms, said his company has detected more than 15,000 individual probes for vulnerabilities on its networks since October. But the scans recently shifted from those looking for vulnerable file transfer protocol servers to Port 53, where DNS resolution queries are handled in older versions of BIND.

"Our remote sites and VPN

users connecting over both dial-up and broadband technologies are also reporting major increases in scans for DNS servers," said Morgan.

Sean Brown, a systems administrator at Applied Geographics Inc., a geographic information system consulting firm in Boston, said he has seen a small rise in scans since Jan. 30. But the impact of those scans can be significant, he said. "I had only seen one Class C sweep for DNS in January before the announcement," said Brown, referring to a network that contains 256 IP addresses. "I've since seen four."

Although that may not seem like a lot, each scan is probably

JUST THE FACTS

Watch for Traffic

You're bound to get hit once in a while, but there are a few things you can do to minimize the damage:

- Block or disallow suspect extensions, like .exe and .vbs.
- Put up layered virus detection and filtration devices inside and outside the firewall.
- Tell your users whenever you see a new virus start to come across, even if you think you're blocking it.

"This is not to say that blocking by extension is bad — it is a massive damage limiter — just that it is not enough," Pemble said. "Scan everything at the gateway, scan everything at the desktop [preferably using different tools.] And then expect to get hit once in a while, anyway." ▮

looking at an entire network of anywhere from 256 IP addresses up to 65,536, said Brown. "The number of potentially vulnerable systems is huge."

Companies belonging to the Information Systems Security Association (ISSA), an Oak Creek, Wis.-based nonprofit group, are also reporting an increase in BIND-related scans, according to an ISSA member who requested anonymity.

In addition, a spokesman for the CERT Coordination Center at Carnegie Mellon University in Pittsburgh confirmed that there has been a significant increase in the number of BIND-related scans.

Still, the cross-breeding of viruses and Internet worms to exploit security gaps in BIND represents a major shift in the way virus writers operate, said Chris Klaus, chief technology officer at Internet Security Systems Inc. in Atlanta.

"Now we're seeing an increase in the number of virus writers using the hacker mentality," Klaus said. Viruses are being designed that automatically search out compromised systems, he said. "If companies haven't thought of a way to routinely check their machines, they're sitting ducks." ▮

DNS Probes on the Rise

Recent network security statistics:

- Attempts to breach online security mechanisms rose **58% in January, to 5,568**, from 3,534 last December.
- Attempts to find vulnerable servers increased **280% to approximately 6,000**.
- Stealth scans are the most common type of malicious activity and increased **88% to 3,102**.
- **Backdoor-G** and **NetBus Trojan** scans have increased in number, while **Hack-a-Tack** and **Back Orifice** have decreased and appear to be out of favor.



FRANK HAYES/FRANKLY SPEAKING

The 85% Solution

IS 85% ENOUGH? Oracle Chairman Larry Ellison thinks so. At last week's Oracle AppsWorld conference in Paris, he told the crowd his company's E-Business Suite "doesn't do everything our customers want. We have an 80% or 85% solution." Like any enterprise system, Oracle's can be customized to a fare-thee-well. But if you use it out of the box — as Ellison says General Electric is doing at 20 manufacturing plants — "an 85% solution in five months is better than a 100% solution in three years."

That's a pretty picture, isn't it? Bet your CEO will like it, too. And that could spell trouble. Because using enterprise software out of

the box isn't really about giving up features. It's about giving up control of how your company does business.

Remember, an enterprise package isn't just an extra-large bundle of features and functionality. Inside the package, there's a model for how a company does business — that's what makes it *enterprise* software.

All the business processes that the enterprise package implements are built on top of that model so they'll work smoothly together. And that's great — if the business-process model inside the software exactly matches your business.

Which, of course, it never does.

And then you have a choice: You can change the software, or you can change your business processes to match the software.

We know what it costs to change the software. We've all seen the projects that dragged on for years, customizing enterprise packages from SAP and PeopleSoft and Baan and Oracle. Everyone underestimated how long customization would take, how hard it would be and how much work had to be done all over again with each new release of the enterprise package.

We also know about companies that didn't customize. Their enterprise projects went up in months instead of years. Their installations were fast and cheap. But there were costs that didn't show up in the project budget — the costs of endless changes and adjustments and unintended consequences from changing their business processes to match the way the software works.

That's the obvious trade-off with out-of-the-box enterprise software: quick and clean on the technical side, messy and disruptive on the business side.

But there's a more subtle trade-off, too: Getting a ready-to-use enterprise system means handing over the job of designing business processes to the software vendor.

That's a lot to trust Oracle or SAP or PeopleSoft for. Not just getting the code right, but also getting the whole business process right. And then keeping it right with each upgrade, as business and markets and customer expectations change.

And *that's* what Larry Ellison is really pitching. Not just an 85% solution, but 100% trust in the vendor's ability to deliver a business model that works — and keeps working, pretty much forever.

Is that a good idea? Maybe, maybe not. It's not your call. If ever there was a technology-related decision that has to be made by top management, the choice to outsource control of business processes has to be it.

But you *can* be sure of one thing: One of these days, your CEO will hear about this dandy idea for saving time and money by implementing an enterprise package without first customizing it.

IT's job then will be to explain what's at stake: not just features or convenience or a fat project for IT — but also who controls how you do business.

Maybe, like GE, your CEO will decide it's the right approach for

certain operations. Maybe he'll conclude it's too much of a gamble.

Either way, make sure he's got the full picture — not just 85% of it. ▀

*It's about
who controls
how your
company
does business.*



Hayes, Computerworld's senior news columnist, has covered IT for more than 20 years. Contact him at frank_hayes@computerworld.com.

SHARK TANK

UPGRADE OF NETWORK

software for 200-plus government employees mostly goes smoothly (it probably helps that this pilot fish left a note at each workstation explaining what he did and why). But one user is furious in the wake of the upgrade. User's e-mail message to fish: "Ever since you worked on my office PC, my home PC hasn't been working right. What did you do to it?"

ZIP TRIP Network administrator pilot fish notices that one user has added a Zip drive to his PC on his own. Curious, the fish asks why. "Yeah, I needed it," user says, "because I get so many e-mail attachments that are zipped."

PLEASE RESPOND ASAP

Consultant's PC is acting up, so just before she goes on vacation, she ships it back to the home office's IT shop for repair. That means it's her pilot fish boss who fumes when he receives a copy of an e-mail message to her from the repair guys, asking for her intranet passwords before they can get to work. "The IT group has administrator rights. They have the capability of changing the password," grumbles the boss. Not to mention that they also have her PC.

WRONG IMAGE Pilot fish stops reading a faxed ad at the point

where the data warehousing tool vendor boasts, "We specialize in extracting data from your back end and bringing it to your forefront."

PLAYING IN TRAFFIC IT pilot fish at a financial services company gets a heads-up from the networking group: One office is using so much bandwidth on the Internet proxy servers that it's affecting users sitewide. The network guys identify the customer service rep responsible, and the fish trucks down to the call center, where one look at the user's desktop reveals the problem. "I identified myself," says the fish, "and asked the user how having the streaming real-time images from four freeway cams could have a bearing on the duties of his job."

TRYING TO KEEP a corporate bigwig in the loop, a pilot fish e-mails him the skinny on a project that was proposed at a work management team meeting. Bigwig fires back a single question: "Who's on this team?" Fish restrains himself from firing back a one-word answer: "You."

Fire one over to me: sharky@computerworld.com. You get a sharp Shark shirt if your true tale of IT life sees print — or if it turns up in the daily feed on the Web at computerworld.com/sharky.

The 5th Wave



"FRANKLY, I'M NOT SURE THIS IS THE WAY TO ENHANCE OUR COLOR GRAPHICS."

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